Vol. 9. No. 8 pp. 515-598. August, 1939

THE VETERINARY BULLETIN

1939

IMPERIAL MYCOLOGICAL INSTITUTE
1 AUG. 1939

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IMPERIAL BUREAU OF ANIMAL HEALTH
WEYBRIDGE, SURREY
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Charles Burrell, (T.U.) Printer, Chertsey.

CONTENTS

LIST OF CHIEF SUBJECTS

[Many subjects dealt with are omitted from the list and will be found in the appropriate places. Particular subjects sometimes appear under different headings: *e.g.* Tuberculosis may appear under :– Diseases caused by Bacteria and Fungi; Immunity; Diseases, General (papers on several diseases); Public Health; Therapeutics; Technique; Reports and Book Reviews].

	PAGE
DISEASES CAUSED BY BACTERIA AND FUNGI [see also Immunity] ...	515-529
Streptococcal infection ...	515
Anthrax	517
Tuberculosis	518
Corynebacterium infection...	521
Swine erysipelas	522
Brucellosis	524
Anaerobic infection	527
DISEASES CAUSED BY PROTOZOAN PARASITES	529-535
Trypanosomiasis	531
Coccidiosis	533
Piroplasmosis...	533
Spirochaetosis	534
DISEASES CAUSED BY VIRUSES ...	535-545
Foot and mouth disease ...	535
Rinderpest	536
Contagious bovine pleuro-pneumonia	538
Equine encephalomyelitis ...	539
Pox	541
Rabies...	542
Various	542
PARASITES IN RELATION TO DISEASE [ARTHROPODS]	545-547
PARASITES IN RELATION TO DISEASE [HELMINTHS] [see also Immunity]	547-552
Trematodes	548
Cestodes	548
Nematodes	550
IMMUNITY [including Allergic and Serological Diagnosis] ...	553-560
Tuberculin	553
Serological diagnosis ...	554
Various	557

	PAGE
DISEASES, GENERAL :	
[General diseases not dealt with under other headings: Organic Diseases, Miscellaneous Diseases and Neoplasms] ...	561-573
NUTRITION IN RELATION TO DISEASE :	
[Articles placed in the section "Diseases General" may also contain references to nutritional factors] ...	573-579
Mineral deficiency	573
Vitamin deficiency	575
PUBLIC HEALTH	579-581
Milk hygiene...	579
Meat hygiene	580
THERAPEUTICS	581-582
PHYSIOLOGY	582-585
TECHNIQUE AND APPARATUS ...	585-587
MISCELLANEOUS	588-590
REPORTS	590-597
Tanganyika Territory ...	590
Palestine	592
Austria	593
Norway	593
Yugoslavia	596
French West Africa... ...	596
BOOK REVIEWS	597-598

INDEX TO AUTHORS

Abderhalden, E., 577.
—, & Abderhalden, R., 577, *bis.*
Abderhalden, R. See Abderhalden, E., jt. author, 577, *bis.*
Ackert, J. E., & Reid, W. M., 548.
Adler, S., & Ellenbogen, V., 534.
Agustine, D. L. See Hegner, R., et al., jt. authors, 597.
di Aichelburg, U., 556.
von Albertini, A., & Grumbach, A., 515.
Alessandrini, A., & Dominici, D., 526.
Andrews, J., & von Brand, T., 531.
—, & Miller, F. W., 531.
Austria, Rep. Mödling Inst., 1937, 593.

Bailly, J. See Remlinger, P., jt. author, 542, 543.
Balozet, L., 541, 542.
Barboni, E., 524.
Bardach. See Bridré, et al., jt. authors, 536.
Bardswell, N. D., 519.
Barger, J. A. See McNutt, S. H., et al., jt. authors, 532.
Barrie, Mary M. O., 578.
Bauer, 590.
Beard, J. W. See Finkelstein, H., et al., jt. authors, 539.
Behnke, J., 555.
Bennetts, H. W., & Hall, H. T. B., 527.
Berliner, V., & Warbritton, Virgene, 584.
Bertolino, P. See Rosati, T., jt. author, 522.
Best, C. H. See Thalhimer, W., et al., jt. authors, 583.
Bethke, R. M. See Krauss, W. E., jt. author, 578.
Bindel, L., 568.
Binns, H. R., 530.
Biocca, E., 527.
Bishop, Lucille M. See Fitch, C. P., et al., jt. authors, 525.
Bittarelli, R., 522.
Blohm, F. See McNutt, S. H., et al., jt. authors, 532.
Bly, H. See Farquharson, J., jt. author, 547.
Bonnet, H., Thieffry, S., & Montefiore, 520.
Boquet, A., 519, 520.
Boyd, W., 597.
Boyd, W. L. See Fitch, C. P., et al., jt. authors, 525.
Bozzelli, R., 531.
Brady, D. E. See Comstock, R. E., jt. author, 584.
Braga, A., 543.
von Brand, T. See Andrews, J., jt. author, 531.
Brandt, A. J., 517.
Brandt, H., 523.
Bridgers, W. H. See Finkelstein, H., et al., jt. authors, 539.
Bridré, Bardach, & Joltrain, 536.
Brit. med. J., 587.
Brocq-Rousseu, D., & Roussel, G., 598.
Brown, A. A. F., 529.
Brown, H. E. See Derrick, E. H., et al., jt. authors, 544.
Buck, G. See Girard, G., et al., jt. authors, 564.
Bull. Hlth Org. L. o. N., 524.
Bull. Serv. zootech. Epiz. A. O. F., 596.
Burnet, F. M., 544.
Butler, E. J., 528.

de Camelis, F., 530.
Cameron, D., 547.
Cameron, T. W. M., 552.
Campbell, A. D., 538, *ter.*
Cannon, D. G., 548.
Carpano, M., 535.
Case, C. H., & Keefer, W. O., 532.
Chelle, P. L. See Cuille, J., jt. author, 570.
Chew, A. P., 589.
Ciurea, V. See Mihailescu, M., jt. author, 528.
Clay, A. L., 551.
Clin. vet., Milano, 531.
Coca, A. F., 566.
Cockayne, A. H., 588.
Comstock, R. E., & Brady, D. E., 584.
Cornell, R. L., 522.
Corper, H. J., 586.
Corwin, L. A., & Desson, L. J., 566.
Coulaud, E., 558.
Cox, H. R., Philip, C. B., Marsh, H., & Kilpatrick, J. W., 540.
Crocker, C. G. See Pijper, A., jt. author, 544.
Cuille, J., & Chelle, P. L., 570.
Culbertson, J. T., & Kaplan, S. S., 522, *bis.*
—. See also Zwemer, R. L., jt. author, 531.
Curasson, G., 596.
Czelny, K., 528, 549.

Dalling, T., 561.
Danelius, G., & Löfstedt, F., 546.
Davis, D. J., 572.
Davis, H. J., Norris, L. C., & Heuser, G. F., 585, *bis.*
Dayus, C. V., 541.
Delaplane, J. P., Erwin, L. E., & Stuart, H. O., 523.
Delpy, L., & Kaweh, M., 518.
Derrick, E. H., Johnson, D. W., Smith, D. J. W., & Brown, H. E., 544.
Desson, L. J. See Corwin, L. A., jt. author, 566.
Dessy, G., 520.
Dickinson, E. M. See Rosenwald, A. S., jt. author, 522.
Diernhofer, K., 526, 555.
Diesperov, A. G. See Polovceva, V. V., et al., jt. authors, 567.
Dieter, R., 571.
Dikmans, A., & Poelma, L. J., 532.
Dols, M. J. L., Jansen, B. C. P., Sizoo, G. J., & van der Maas, G. J., 574.
Dominici, D. See Alessandrini, A., jt. author, 526.
Dorman, S. C., Hale, W. C., & Hoskins, W. M., 545.
Drimmelen, G. C., 517.

Ecker, E. E., 559.
Eichhorn, A., & Wyckoff, R. W. G., 540.
Ellenbogen, V. See Adler, S., jt. author, 534.
Eriksson, K., 566.
Erwin, L. E. See Delaplane, J. P., et al., jt. authors, 523.
Evans, S. A., 525, 548, 553, 591.

Farinas, E. C., 589.
Farquharson, J., & Bly, H., 547.
Fedotov, A. I., 583.
Ferguson, R. R., 580.
Finkelstein, H., Marx, W., Bridgers, W. H., & Beard, J. W., 539.
Finzi, G., 553.
Fitch, C. P., Bishop, Lucille M., & Boyd, W. L., 525.
Foerster, W., 524.
Fraser, A. H. H., Thomson, W., Robertson, D., & George, W., 550.
Freund, J., & Opie, E. L., 558.
Fritzsche, K., 572, *bis.*
Fröhle, O., 555.
Fry, R. M. See Hare, T., jt. author, 515.
Fukusho, K. See Nakamura, J., et al., jt. authors, 536.

Gallup, W. D., & Norris, L. C., 574, *bis.*
Galvao, P. E., 577.
Garlick, G. G., 532.
Gaus, O., 583.
George, W. See Fraser, A. H. H., et al., jt. authors, 550.
Gillain, J. See Rodhain, J., jt. author, 552.
Girard, G., Robic, J., & Buck, G., 564.
Glover, R. E., 519.
Goreczky, L. See Gratia, A., jt. author, 558.
Gräub, E., & Zschokke, W., 527.
Gratecos. See Marotel, jt. author, 548.
Gratia, A., & Goreczky, L., 558.
Green, R. G., & Larson, C. L., 571.
Gregoire, C., 577.
Grimpret, G., 543, 564.
Gros, H. See Joyeux, C., et al., jt. authors, 549.
Grumbach, A. See von Albertini, A., jt. author, 515.
Grycz, E., & Ksiazkiewicz, T., 522.
Grzycki, St., & Gucfa, W., 569.
Gucfa, W. See Grzycki, St., jt. author, 569.
Guilbert, H. R., & Hart, G. H., 575.
—, Miller, R. F., & Hughes, E. H., 575.

Häntsch, L., 554.
Hale, W. C. See Dorman, S. C., et al., jt. authors, 545.
Hall, H. T. B. See Bennetts, H. W., jt. author, 527.
Hammersland, H. L., Herrin, H. S., & Haynes, C. F., 541.
Hare, T., & Fry, R. M., 515.
Hart, G. H. See Guilbert, H. R., jt. author, 575.
Hart, L. See Hungerford, T. G., jt. author, 535.
Haynes, C. F. See Hammersland, H. L., et al., jt. authors, 541.
Hegner, R., Root, F. M., Agustine, D. L., & Huff, C. G., 597.
Heidelberger, M., & Kendall, F. E., 557.
le Hénaff, N., 578.
Henneberg, O. H., 580.
Henschen, F., 565.
von Hepding, L., 564.
Herrin, H. S. See Hammersland, H. L., et al., jt. authors, 541.
Hetzer, H. O., 524.
Heuser, G. F. See Davis, H. J., et al., jt. authors, 585, *bis.*
Hoffmann, F. See Köves, J., jt. author, 559.
Hofmann, F., 590.
Hopkirk, C. S. M., 561.
Hornby, H. E., 529, 581, 590.
Horsfall, Margery W., & Jones, Myrna F., 548.
Hoskins, W. M. See Dorman, S. C., et al., jt. authors, 545.
Howitt, Beatrice F., 539.
Huff, C. G. See Hegner, R., et al., jt. authors, 597.
Hughes, E. H. See Guilbert, H. R., et al., jt. authors, 575.
Hughes, T. P. See Scherp, H. W., jt. author, 586.
Hungerford, T. G., & Hart, L., 535.
Hupbauer, A., 568, 596.
—, & Lugomer, V., 541.

Irving, J. T., & Richards, Marion B., 575.

Jacobsen, E. See Petersen, C. B., jt. author, 535, *bis.*
Jacquet, J., 560, *bis.*
Jansen, B. C. P. See Dols, M. J. L., et al., jt. authors, 574.
Janssens, P. G., 530.
Johnson, D. W. See Derrick, E. H., et al., jt. authors, 544.
Joltrain. See Bardach, et al., jt. authors, 536.
Jones, Myrna F. See Horsfall, Margery W., jt. author, 548.
J. Dep. Agric. Vict., 535.
Joyeux, C., Senevet, G., & Gros, H., 549.

Joyner, A. L. See Sabin, F. R., et al., jt. authors, 521.
Judovič, S. S. See Polovceva, V. V., et al., jt. authors, 567.
Juge, 538.
Jullien, J., 525.
Jungherr, E., & Landauer, W., 572.

Kaplan, S. S. See Culbertson, J. T., jt. author, 552, *bis*.
Kathe, 580.
Kaweh, M. See Delpy, L., jt. author, 518.
Keefer, W. O. See Case, C. H., jt. author, 532.
Kemp, T., 566.
Kendall, F. E. See Heidelberger, M., jt. author, 557.
Kerr, K. B., 551.
Kilpatrick, J. W. See Cox, H. R., et al., jt. authors, 540.
Klimmeck, 580.
Koch, J., 586.
de Kock, G., 564.
Köves, J., & Hoffmann, F., 559.
Koschucharoff, P., 518.
Krauss, W. E., & Bethke, R. M., 578.
Kreguer, A. See Weinberg, M., jt. author, 558.
Kroó, H., & Orbaneja, J. G., 534, *bis*.
Ksiazkiewicz, T. See Grycz, E., jt. author, 522.
Kulczycki, L., 536.
Kunert, H., 536.
Kuwabara, T., 519.
Kwiatkowska, Aniela, & Moscicki, Marian, 552.

Labatut, R. See Lasserre, R., et al., jt. authors, 571.
Labranca, G., 527.
Lambert, F. R., 533.
Landauer, W., 565.
—. See also Jungherr, E., jt. author, 572.
Lange, L., & Pescatore, H., 521.
Larson, C. L. See Green, R. G., jt. author, 571.
Lasserre, R., Lombard, C., & Labatut, R., 571.
Linon, G., 589.
Lister, S., 592, *bis*.
Locke, R. C., 579.
Löfstedt, F. See Danelius, G., jt. author, 546.
Lombard, C. See Lasserre, R., et al., jt. authors, 571.
Lopes de Aboim Inglez, A., 518.
Lopes, H. de S., 545.
Lopyrin, A. I. See Polovceva, V. V., et al., jt. authors, 567.
Love, E. L., 555.
Lowe, H. J., 588, 591.
Lugomer, V. See Hupbauer, A., jt. author, 541.
Lukasiak, J., 547.

van der Maas, G. J. See Dols, M. J. L., et al., jt. authors, 574.
McCallum, Jennie W. See Stewart, J., jt. author, 575.
Macchioni, I., 570.
McGowan, J. P., 574.
Macindoe, R. H. F., 547.
McNaught, K. J., 587.
McNutt, S. H., Blohm, F., & Barger, J. A., 532.
—, & Wall, J. F., 575.
Marotel, & Gratecos, 548.
Marsh, H. See Cox, H. R., et al., jt. authors, 540.
Marx, W. See Finkelstein, H., et al., jt. authors, 539.
Medlock, F., W., 579.
Merzdorf, G., 582.
Meyer, J. R., 581.
Miègeville, J., 569.
Miessner, H., 568.
Mihailescu, M., & Ciurea, V., 528.
Milks, H. J., 566.
Miller, F. W. See Andrews, J., jt. author, 531.
Miller, R. F. See Guilbert, H. R., et al., jt. authors, 575.
di Mino, G. See Rosati, T., jt. author, 527.
Moguel, F., 589.
Mollin, F. E., 562.
Montefiore. See Bonnet, H., et al., jt. authors, 520.
Moore, L. A., 575.
Morton, H. E., & Pulaski, E. J., 585.
Morton, R. A., 585.
Moscicki, Marian. See Kwiatkowska, Aniela, jt. author, 552.
de Moulin, F., & Soemanegara, R. M., 517.
Mueller, J. F., 550.
Murciani, C., 571.

Naik, R. N., 537.
Nakamura, J., Wagatuma, S., & Fukusho, K., 536.
Nash, T. A. M., 546.
Negri, R., 553.
Nieschulz, O., 534.
de Nito, G., 584.
Norris, L. C. See Davis, H. J., et al., jt. authors, 585, *bis*.
—. See also Gallup, W. D., jt. author, 574, *bis*.
Norsk VetTidsskr, 525.
Norway, Rep. Civil vet. Serv., 1933, 593.
—, Rep. Civil vet. Serv., 1934, 594.
—, Rep. Civil vet. Serv., 1935, 594.
—, Rep. Civil vet. Serv., 1936, 595.

Obitz, K., 545.
Opie, E. L. See Freund, J., jt. author, 558.
Oppermann, T., 568.
Orbaneja, J. G. See Kroó, H., jt. author, 534, *bis*.

Palestine, Rep. Govt. vet. Serv., 1938, 592.
Panisset, L., 561.
Parnell, I. W., 551.
Parnes, J., 569.
Pasqua, A., 570.
Patterson, J. B. E., 573.
Peck, E. F., 563.
Pedersen, K. O. See Seibert, Florence B., et al., jt. authors, 554.
Pennacchi, L., 541.
Peragallo, I., & Scuti, R., 560.
Perdrau, J. R., 544.
Pescatore, H. See Lange, L., jt. author, 521.
Petersen, C. B., & Jacobsen, E., 535, *bis*.
Petrov, A. M., 582.
Pettersson, B., 546.
Philip, C. B. See Cox, H. R., et al., jt. authors, 540.
Pijper, A., & Crocker, C. G., 544.
Pochon, J. See Prévot, A. R., jt. author, 554.
Poelma, L. J. See Dikmans, A., jt. author, 532.
Poginova, N. V. See Polovceva, V. V., et al., jt. authors, 567.
Pollock, R. C., 588.
Polovceva, V. V., Poginova, N. V., Lopyrin, A. I., Judovič, S. S., & Diesperov, A. G., 567.
Prévot, A. R., & Pochon, J., 554.
Pristojkovic, S., 556.
Proc. 25th-28th Conf. Amer. Ass. Med. Milk Comm. 1932-1935, 578.
Pulaski, E. J. See Morton, H. E., jt. author, 585.

Quin A., H., Jr., 533.

Rao, R. S., 542.
Rastegar, R., 523.
Ray, H. N., 533.
Rayski, C., 551.
Rec. Méd. vét., 518.
Reid, A. H., 521.
Reid, W. M. See Ackert, J. E., jt. author, 548.
Reihart, O. F., 582.
Remlinger, P., 543.
—, & Bailly, J., 542, 543.
Rep. Dep. vet. Sci. Tanganyika, 1937, 591, *bis*.
Rev. Méd. vét., Toulouse, 590.
Rexroth, E., 587.
Richards, Marion B. See Irving, J. T., jt. author, 575.
Riedel, 580.
Rivera, E., 553.
Robertson, D. See Fraser, A. H. H., et al., jt. authors, 550.
Robic, J. See Girard, G., et al., jt. authors, 564.
Rodhain, J., & Gillain, J., 552.
Rogers, L., 562.
Rogoni, A., 553.
Root, F. M. See Hegner, R., et al., jt. authors, 597.
Rosati, T., & Bertolino, P., 522.
—, & di Mino, G., 527.
Rosenwald, A. S., & Dickinson, E. M., 522.
Rossi, P., & Saunié, M. L., jt. author, 528.
Roussel, G. See Brocq-Rousseu, D., jt. author, 598.
le Roux, G., & Tran-Ngoc-Hoan, jt. author, 537.
Rudd, G. V. See Ward, H. K., jt. author, 516.
Rudolf, H., 555.
Runge, S., 584.

Sabin, F. R., Joyner, A. L., & Smithburn, K. C., 521.
Sabovljev, A., 582.
Saenz, A., 557, *bis*.
Salgues, R., 575.
Salomon, W., 586.
Salow, H., 554.
Saunié, M. L. See Rossi, P., jt. author, 528.
Savickis, J., 552.
Scherp, H. W., & Hughes, T. P., 586.
Schulz, F. N., 598.
Scuti, R. See Peragallo, I., jt. author, 560.
Seddon, H. R., 539.
Seibert, Florence B., Pedersen, K. O., & Tiselius, A., 554.
Sen, K. C., & Seshan, P. A., 575.
Senevet, G. See Joyeux, C., et al., jt, authors, 549.
Seshan, P. A. See Sen, K. C., jt. author, 575.
Sharif, M., 546.
Sizoo, G. J. See Dols, M. J. L., et al., jt. authors, 574.
Smith, D. J. W. See Derrick, E. H., et al., jt. authors, 544.
Smith, J. M., 592.
Smithburn, K. C. See Sabin, F. R., et al., jt. authors, 521.
Sniečkiene, P., 533.
Soemanegara, R. M. See de Moulin, F., jt. author, 517.
Solandt, D. Y. See Thalhimer, W., et al., jt. authors, 583.
Stewart, Helen M., 531.
Stewart, J., & McCallum, Jennie W., 575.
Stewart, J. L., 529.
Stewart, W. L., *quat*, 562.
Stieglecker, G., 584.
Stock, P. G., 581.
Stockklausner, 567.
Stryszak, A. S., 542.

Stuart, H. O. See Delaplane, J. P., et al., jt. authors, 523.
Swales, W. E., 547, *bis*, 565.

Tacken, P. H. W., 569.
Talysine, T. T., 549.
Tang, F. F., & Wei, H., 542.
Tanganyika Territory, Ann. Rep. Dep. vet. Sci. Anim. Husb., 1937, 590.
—, Veterinary Education, 1937, 588.
Thalhimer, W., Solandt, D. Y., & Best, C. H., 583.
Thieffry, S. See Bonnet, H., et al., jt. authors, 520.
Thomas, J. J., 579.
Thomson, W. See Fraser, A. H. H., et al., jt. authors, 550.
Thorshaug, N. P., 593, 594, *bis*, 595.
Tillett, W. S., 516.
Tiselius, A. See Seibert, Florence B., et al., jt. authors, 554.
Tobback, L., 546.
du Toit, P. J., 589.
Tran-Ngoc-Hoan. See le Roux, G., jt. author, 537.
Travassos, J., 544.

Union of S. Africa, Rep. Inst. med. Res., 1936, 592.
—, Rep. Inst. med. Res., 1937, 592.

Vaz, Z., 545.
Vet. Arhiv., 596.
Vet. Med., 540.
Vet. Rec., 588.
Voegel, H., 573.

Wagatuma, S. See Nakamura, J., et al., jt. authors, 536.
Wall, J. F. See McNutt, S. H., jt. author 575.
Warbritton, Virgene. See Berliner, V., jt. author, 584.
Ward, H. K., & Rudd, G. V., 516.
Wei, H. See Tang, F. F., jt. author, 542.
Weinberg, M., & Kreguer, A., 558.
Wells, A. Q., 520.
Wien. tierärztl. Mschr, 593.
Wilson, J. E., 588.
Wüstenberg, J., 516.
Wyckoff, R. W. G. See Eichhorn, A., jt. author, 540.

Zagrodzki, K., 556.
Zakrzewski, A., 535.
Zeinert, 580.
Zschokke, W. See Gräub, E., jt. author, 527.
Zwemer, R. L., & Culbertson, J. T., 531.

Bulletins on disease subjects written for farmers and "popular" articles of a similar nature are not included in the *Veterinary Bulletin*. Those of a sufficiently important nature, are, however, included in *Index Veterinarius*; so also are certain review articles, presidential addresses, congress proceedings, etc., where the title conveys as much information as could be given in an abstract of a few lines. For information of this nature, readers of the *Veterinary Bulletin* are referred to *Index Veterinarius*, where titles of all publications indexed by the bureau are fully cross-referenced.

INDEX VETERINARIUS.

See notice on page 4 of cover.

IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 9.] August, 1939. [No. 8.

DISEASES CAUSED BY BACTERIA AND FUNGI

HARE, T., & FRY, R. M. (1938). **Clinical Observations of the Beta Haemolytic Streptococcal Infection of Dogs.**—*Vet. Rec.* **50.** 1537-1549.

The authors describe an acute contagious disease in dogs due to beta-haemolytic streptococci. From a study of 128 cases in bitches, dogs and puppies, the clinical picture appeared to be the same whichever type of beta-haemolytic streptococcus was concerned. After an incubation period of 2-7 days, the onset of infection was marked by fever, respiratory catarrh, adenitis and dermatitis with desquamation which usually prolonged the course of the disease. Symptoms were more severe in younger patients, and the mortality rate was high only in the foetus and in puppies up to a fortnight old, born of infected bitches. Reference is made to coincident disease or to complications, *e.g.* roundworm infestation, nephritis, arthritis and spasmophilia, and to the differential diagnosis from such conditions as dog distemper, parasitic dermatitis and chronic nephritis. Details are given of nine case histories and prophylactic and curative measures are suggested.

A discussion followed in which STEELE-BODGER laid emphasis on the insidious nature of the chronic type of the disease, the common occurrence of haemolytic streptococci in the throat or vagina of clinically healthy animals, and the value of recto-oesophageal lavage with saline in the treatment of complications like gastro-enteritis or spasmophilia. He stated that chronic nephritis is common in kennels in which infection with the haemolytic streptococcus occurs and that it may be due to the streptococcus. An instance was given of sterility and uterine inertia among bitches in a heavily infected kennel being appreciably reduced by the use of autogenous vaccine ; the condition was constantly associated with acute pruritus. MONTGOMERIE questioned HARE's opinion that a haemolytic streptococcus is the true cause of the disease conditions described.—R. O. MUIR.

VON ALBERTINI, A., & GRUMBACH, A. (1937). Die experimentelle Streptokokkeninfektion des Kaninchens in ihre Beziehungen zur Herdinfektion. [**Experimental Streptococcal Infection in Rabbits and its Relation to Local Infection**].—*Ergebn. allg. Path. path. Anat.* **33.** 314-423. 74 figs. [Numerous refs.]

This is a review of experiments, and is unsuitable for abstraction. The

authors set out to clarify the very confused subject of local infection and to this end they quote extensively and discuss the general literature on this subject, but in the main they confine their review and their own experiments to streptococcal infections. Some of the more important headings considered are :– the importance of variation in relation to the identification of streptococci ; common sites of localized streptococcal infection ; the exact definition of local infection, and a critical analysis of ROSENOW'S and WARREN CROWE'S contentions regarding the frequency and distribution of streptococcal types. Thereafter follow records of special studies of streptococcal types, the influence of passage, and immunization. The final and probably most useful section of the publication consists of a study of the histopathology of localized streptococcal infection in rabbits, the actual anatomical sites studied including the endocardium, lungs, joints, bones, epiphyses, osteomyeloid tissue, striated muscle, kidney, liver, gall-bladder, alimentary canal, aorta, spleen, eye and brain. [The article lacks an adequate summing-up of the authors' opinions and conclusions, and whilst a certain amount of data has been made available and a useful bibliography has been compiled, the reviewer cannot see that this work throws much new light upon the whys and wherefores of localized infection].—E. J. PULLINGER.

TILLETT, W. S. (1936). **The Differentiation of Human and Animal Strains of Hemolytic Streptococci on the Basis of Fibrinolytic Activity.**—*Proc. 25th-28th Conf. Amer. Ass. Med. Milk Comm. 1932-1935.* pp. 230-238.

Fibrinolysin from haemolytic streptococci, whilst acting on normal human fibrin, does not visibly affect fibrin from the blood of laboratory animals. Only streptococci having true beta-haemolysis are fibrinolytic. Cultures of beta-haemolytic streptococci of human origin were highly fibrinolytic, but, on the other hand, animal strains were not. There is a relationship between the infectivity of the organism and its fibrinolytic property, and the presence or absence of this property is a means of distinguishing human strains.—H. E. BYWATER.

WÜSTENBERG, J. (1937). Die Bedeutung der Typendifferenzierung der hämolytischen Streptokokken für die Praxis. [**The Importance of Type Differentiation of Haemolytic Streptococci**].—*Zlb. Bakt. I.* (*Orig.*). **140.** 83-86.

Type differentiation of haemolytic streptococci is important from a clinical point of view in that it makes it possible to administer the correct homologous antiserum for therapeutic or prophylactic purposes. From the epidemiological viewpoint, typing is important in tracing the source of epidemics and following their course throughout the community.—E. J. PULLINGER.

WARD, H. K., & RUDD, G. V. (1938). **Studies on Haemolytic Streptococci from Human Sources. I. The Cultural Characteristics of Potentially Virulent Strains.**—*Aust. J. exp. Biol. med. Sci.* **16.** 181-192. 7 figs., 2 tables. [7 refs.]

The authors have classified haemolytic streptococci isolated from diverse human sources, and stock cultures of all the agglutinating types of Griffith, according to the type of growth obtained in a special serum broth and serum peptone agar. They claim that macroscopic examination of such cultures enabled them to distinguish haemolytic streptococci of Group A from those of other groups. Thus the more laborious technique of the precipitin test may be avoided in routine work. [It is not claimed that this differentiation would be obtained with haemolytic streptococci from animal sources, but to veterinary bacteriologists there is much of interest in this technique which may find a wider application].—T. S. GREGORY.

DRIMMELEN, G. C. (1938). **An Outbreak of an Unusual Type of Anthrax in Cattle in the Eastern Transvaal.**—*J. S. Afr. vet. med. Ass.* **9.** 190-191. [3 refs.]

An outbreak of anthrax is described in which very marked swelling in the throat region, interfering with breathing and swallowing, was noted in affected cattle. Three died and no anthrax bacilli could be found in one, but they were demonstrated in smears from the glands in the throat-region of the second, and in the blood of the third.—E. M. ROBINSON.

BRANDT, A. J. (1938). Miltbrandsepidemien 1937. [**Anthrax in Norway in 1937**].—*Norsk VetTidsskr.* **50.** 4-40. 8 figs. [English and German summaries].

B. first gives a statistical survey of the occurrence of anthrax in Norway from 1889 up to the present time. From the figures quoted it may be seen that the total number of cases varied considerably from year to year, but there has been a definite decrease, only 42 cases having occurred in 1935. The disease occurs sporadically, all over the country and at all times of the year, although most frequently during the latter part of the winter when imported concentrates are fed to the livestock. Such concentrates are incriminated as the main source of the infection.

He then gives a comprehensive report of an outbreak of anthrax that occurred in Buskerud county during the summer months of 1937, in which 103 farm animals (58 horses, 43 cows, and 2 pigs) and one human being were affected. Emphasis is laid on the comparatively large number of horses that were attacked and on the extent to which oedematous swellings occurred along the under surfaces of the body. In no case did young sucking foals contract anthrax from infected dams, and no bacilli could be found in the blood of living diseased animals, although they were easily demonstrated in blood from cutaneous haemorrhages immediately after death. Exact diagnosis was therefore difficult during life.

The locality in which the disease occurred was a typical forest district and the summer in question intensely warm, so that insects of every kind were numerous. All these factors led to the view that blood-sucking insects, especially Tabanidae, played an important role in the transmission of the infection. This theory was strongly supported by the fact that virulent anthrax bacilli were demonstrated in the gut of tabanids collected from anthrax carcasses immediately after death. It was believed that the man who died had contracted the infection through the bite of an infected insect.

In the control of the disease, anthrax serum was extensively used, for both prophylactic and curative purposes. Neosalvarsan and prontosil given intravenously were of no value.—GUSTAV NAERLAND (OSLO).

DE MOULIN, F., & SOEMANEGARA, R. M. (1937). Over den levensduur van miltvuurkiemen in het dierlijk organisme. [**Viability of Anthrax Bacilli in the Animal Body**].—*Ned.-ind. Bl. Diergeneesk.* **49.** 276-293. 2 tables. [10 refs.] [English summary].

In a region like the East Indies, where anthrax is prevalent, the authors thought it of interest to investigate how long anthrax bacilli remain viable in the animal body, and whether they eventually undergo a change in virulence. Experiments showed that, in rabbits which were infected with virulent material, but which had not died, the bacilli became avirulent within a few days, without any spread of the infection. Simultaneous injection of the antiserum caused the disease to take a chronic course. The authors report that, in previously immunized

animals, the grade of virulence of a strain may descend to a level which varies for different animals; in naturally immune animals, however, the virulence is not reduced. In immunized animals, anthrax spores can be demonstrated at the site of injection for a period of at least two months in mammals; in fowls so inoculated the spores survive for six weeks.—C. Bubberman (Schiedam).

Delpy, L., & Kaweh, M. (1937). Transmission de Bacillus anthracis à l'homme par Argas persicus Oken 1818. [**Transmission of Anthrax to Man by** *A.p.*] —*Rev. Path. comp.* **37.** 1229-1234. [11 refs.]

The authors describe a case of malignant pustule in a laboratory assistant who had been bitten on the hand by an *A.p.* nymph. The lesion developed at the site 14 days after the bite and *B.a.* was cultivated from fluid from the pustule. The authors discuss the possible role of the Argasidae in the causation of the unexplainable cases of anthrax in man in Persia.—D. L. Hughes.

Koschucharoff, P. (1938). Die Behandlung des menschlichen Milzbrandes in Bulgarien mit besonderer Berüchsichtigung der Immunserumtherapie. [**Treatment of Human Anthrax in Bulgaria, with Notes on Serotherapy**]. —*Z. ImmunForsch.* **92.** 53-73.

Anthrax is a wide-spread disease in Bulgaria, both in man and in animals; 2,000-3,000 animal cases and 800-1,100 human cases occur annually. In man, the malignant pustule is the form of the infection generally seen. Amongst methods of treatment the intramuscular inoculation of hyperimmune serum is widely used. A course of treatment, which starts with a dose of 25-50 c.c. given twice daily, continues for days or even weeks, gradually increasing doses being given. This is a clinical article, and details of the method used in producing the antiserum are not given.—E. J. Pullinger.

—. (1938). Prophylaxie de la tuberculose des bovidés. [**Circular of 2nd March, 1938, concerning Law for the Control of Bovine TB. (France)**]—*Rec. Méd. vét.* **114.** 429-431.

This circular fixes the amount of compensation to be paid to farmers for the slaughter of those of their cattle which are diagnosed as being tuberculous, and the means by which this compensation is to be paid according to the terms of the law of July 7th, 1933. An extra sum of 6% of the amount paid to the farmer can be paid to the agricultural assurance associations to cover their expenses in supporting the action of the veterinary services.

Lopes de Aboim Inglez, A. (1937). A tuberculose nos bovinos adultos abatidos no Matadouro Municipal de Lisboa. [**TB. in Cattle Slaughtered at Lisbon Abattoir**].—*Bol. pecuár.* **5.** 73-96. 5 figs., numerous tables, 1 chart.

TB. is the principal cause of the rejection of animals at abattoirs in Portugal. As the result of a year's survey, it was found that 8% of the animals brought to the Lisbon abattoir were tuberculous, but this percentage was less than it should be because of the inadequacy of the examinations made and the lack of a laboratory at the abattoir. The percentages of infected cattle according to their breed and place of origin are compared. Animals from Africa were most often found infected, while the lowest incidence was among those from the north of Portugal.

Bardswell, N. D. (1939). **Tuberculosis in Cyprus. (Final Report).**—*Tubercle, Lond.* **20.** 165-193. 12 figs., 10 tables, 15 charts, 3 appendixes. [3 refs.]

It is stated in this article that the Chief Veterinary Officer has reported Cyprus to be now free from bovine tuberculosis.—J. E.

Kuwabara, T. (1938). **Susceptibility of Cats to Tubercle Bacilli.**—*Kitasato Arch.* **15.** 318-329. 2 figs. on 1 plate, 2 tables. [7 refs.]

Erythrocyte sedimentation tests, intradermal reactions, and phagocytic phenomena were studied in about 200 healthy cats, which were then inoculated intravenously or subcutaneously with 0·05-5 mg. of human or bovine type tubercle bacilli. The animals were kept under observation during the succeeding three months, and the reactions noted above were tested from time to time. In addition, body temperatures and weights were observed at frequent intervals. Macroscopic and histological P.M. examinations were made one, two and three months after inoculation.

The cats were immune to the human type of the organism, but were highly susceptible to the bovine type. Intravenous inoculation of 0·05 mg. of the latter strain produced marked lesions in all viscera within a month, and death in three months. Following subcutaneous inoculation, the changes were definite but less marked. There was no change in body temperature or R.B.C. sedimentation rate, and no reaction to the tuberculin test, but in the cats inoculated with bovine type bacilli there was a temperature rise of 0·5°-1·5°C. three weeks after inoculation, followed by progressive loss in weight.

In cats inoculated with 5 mg. of the human type, a few bacilli could be isolated up to two months, but none after three months, and no histological changes could be detected.—D. D. Ogilvie.

Glover, R. E. (1938). **Cultural Methods in the Diagnosis of Bovine Tuberculosis.**—*Vet. Rec.* **50.** 981-983. [16 refs.]

G. reviews the use of cultural methods in the diagnosis of TB. in man, quoting at length an editorial article in the *Brit. med. J.* (1938). Jan. 15th. 126. The general consensus of opinion is that cultural methods are more reliable than the direct microscopic examination of sputum smears in the diagnosis of pulmonary tuberculosis in man.

The value of the microscopic method for the detection of tubercle bacilli in milk is discussed, and comparisons from the literature are made with cultural and biological methods. G. concludes that, although cultural methods have not been widely used for the detection of tubercle bacilli in milk, they might be of use in selected samples.—D. L. Hughes.

Boquet, A. (1938). Recherches sur la virulence des bacilles tuberculeux du type humain et du bovin inoculés au lapin par voie méningée. [**Virulence of the Human and Bovine Types of Tubercle Bacilli Inoculated Intrameningeally into Rabbits**].—*Ann. Inst. Pasteur.* **61.** 479-511. 7 tables. [Num. refs.]

The virulence of 41 strains of human tubercle bacilli and 24 bovine strains was compared by the injection of 0·01 mg. of each into rabbits intrameningeally. The bovine strains normally caused paralysis within three weeks, followed by death within a few days. The human strains caused paralysis only in exceptional cases and then after at least four weeks, while death was often delayed for 100 or 200 days. The same results were obtained whether the inoculum consisted of suspensions of infected tissues or cultures. The human strains were found to be of normal pathogenicity on intravenous injection. On the other hand, suspensions of the

meninges of rabbits inoculated with human strains but not showing clinical symptoms caused death when inoculated into g. pigs.—P. S. Watts.

Wells, A. Q. (1938). **The Susceptibility of Voles to Human and Bovine Strains of Tubercle Bacilli.**—*Brit. J. exp. Path.* **19.** 324-328. 1 table. [2 refs.] [See also *V. B.* **8.** 340].

A series of voles were injected with falling doses of standard strains of human and bovine tubercle bacilli. Large doses of the human type (1 mg.) produced a progressive disease, but smaller amounts (0·1 mg. and under) were without effect. On the other hand, voles were very susceptible to the bovine strains, of which as small an amount as 0·00001 mg. produced wide-spread disease within four weeks.

These results suggest that the vole is highly satisfactory for the differentiation of human from bovine strains. A dose of 0·0001 mg. injected intraperitoneally should determine within one month whether a strain is of the human or bovine type.—R. E. Glover.

Boquet, A. (1938). Détermination, par l'inoculation au cobaye, de la teneur des produits tuberculeux en bacilles de Koch. [**Determination of the Presence of Bacilli in Tuberculous Products, by Inoculation of Guinea Pigs**].—*C. R. Soc. Biol. Paris.* **128.** 844-846. 3 tables. [3 refs.]

A comparison is made of the numbers of tubercle bacilli in human tuberculous products and caseating porcine and bovine lymph nodes. Equal volumes of finely ground saline suspensions, containing 0·1-0·000001 mg. of material per c.c., were injected subcutaneously into g. pigs and the minimal infective dose determined. The bacillary content of the porcine and bovine products equalled that of human tuberculous pus, but was much less than that of pulmonary lesions in man and in the g. pig.—R. O. Muir.

Bonnet, H., Thieffry, S., & Montefiore. (1938). Présence d'un bacille tuberculeux de type aviaire dans un ganglion de lymphogranulomatose maligne. [**Avian Tubercle Bacillus in a Lymph Node in a Case of Malignant Lymphogranulomatosis**].—*C. R. Soc. Biol. Paris.* **128.** 583-585.

The authors report the isolation of avian tubercle bacilli from a mediastinal lymph node taken from a human being affected with Hodgkin's disease. The bacilli showed typical biological characters, and tuberculin prepared from them gave results identical with those given by the avian tuberculin issued by the Pasteur Institute.—R. O. Muir.

Dessy, G. (1937). La vaccinazione preventiva e curativa della tuberculosi. [**Preventive and Curative Vaccination against TB.**]—*Atti VI Congr. naz. Microbiol., Milan. 1937.* pp. 535-616. [Numerous refs.]

This is a very extensive review with quotations or citations from nearly 600 published articles. It illustrates the enormous amount of research on the immunology of TB., as well as the difficulties concerning the production of a reliable vaccine.

After introductory chapters on natural and acquired immunity, notes are given on vaccines prepared from :– tubercle bacilli killed by heat or chemicals, fractionated antigens prepared from the bacilli, bacilli exposed to sunlight, live bacilli of heterologous type, attenuated bacilli (including BCG), bacilli in the S phase, and virulent bacilli [Belfanti-Dessy vaccine, *V. B.* **9.** 220].

Vaccines etc., for curative use in human medicine are also discussed.—J. E.

Sabin, F. R., Joyner, A. L., & Smithburn, K. C. (1938). **Cellular Reactions to Polysaccharides from Tubercle Bacilli and from Pneumococci.**—*J. exp. Med.* **68.** 563-582. 4 figs. on 1 plate, 4 tables, 6 charts. [18 refs.]

The authors carried out three types of experiment, which are described separately, *viz* :–

(1). Normal and tuberculous g. pigs were given large intracardiac and intraperitoneal injections of tuberculopolysaccharide (separated from the ether-alcohol extract of human tubercle bacilli, strain A-10); the polysaccharides proved relatively innocuous.

(2). Intraperitoneal injections of small amounts of polysaccharides from tubercle bacilli and from pneumococci called forth larger numbers of leucocytes from the blood vessels than did injections of the same amount of dextrose, trehalose or saline.

(3). In order to ascertain the effect on bone-marrow of repeated injections, two normal rabbits received daily intraperitoneal injections, one for six weeks and the other for six months, of 10 mg. of tuberculopolysaccharide from bovine tubercle bacilli, in 1 c.c. of distilled water. The first reaction to these was a withdrawal of leucocytes from the peripheral vessels and a compensatory draining of new neutrophiles from the marrow into the sinuses of the marrow; this was followed by a building up of the marrow through the products of disintegration of the extravasated neutrophiles.—H. V. Hughes.

Lange, L., & Pescatore, H. (1937). Beobachtungen über die Gewinnung und das Verhalten von Reinkulturen des Paratuberkulosebazillus (Johneschen Bazillus). [**Pure Cultivation of** *Mycobacterium johnei*].—*Zlb. Bakt. I. (Orig.).* **140.** 1-22. 5 tables. [12 refs.]

Growths of *Mycobact. johnei* on various types of medium were compared, and the authors arrived at the general conclusions reached by other workers, namely that media, whether synthetic or otherwise, should contain extract of acid-fast bacillus to ensure good growth. [The experiments which the authors record here are not of great value, because in the study of the growth of *Mycobact. johnei*, either heavy inoculations of pure cultures were used, or else intestinal emulsion was so rich in organisms that these could readily be seen microscopically. Actually the important point is to find a medium which gives the best results when very few organisms are seeded, because the chief problem in Johne's disease is the diagnosis of early cases of infection in which the organisms are few and widely scattered].—E. J. Pullinger.

Reid, A. H. (1938). **Discussion on Caseous Lymphadenitis of Sheep.**—*Rep. 1st Imp. vet. Conf. Lond., 1938.* pp. 40-41. Weybridge: Imperial Bureau of Animal Health. [5s.]

R. gave an outline of the disease and stated that there was nothing new to report. It is now very rare in imported sheep carcasses examined in London. Mr Max Henry described the position in Australia and emphasized what is being done to prevent skin wounds during shearing and the introduction of infective materials to sheep.

Lt.-Col. Dunlop-Young described the disease from the meat inspection viewpoint and stated that caseous lesions in swine were due to infection by *Salmonella cholerae-suis*. Dr. Hopkirk spoke of the strict British meat inspection regulations, which demanded the incision of carcasses at New Zealand abattoirs.

—J. E.

Bittarelli, R. (1937). Le infezioni da " B. pyogenes " nei ruminanti. Contributo sperimentale allo studio dell'azione patogena del " pyogenes bovis " nelle pecore. [*Corynebacterium pyogenes* **Infection in Ruminants**].—*Nuova Vet.* **15.** 65-72. 3 figs.

Bovine mastitis caused by *Corynebact. pyogenes* occurs frequently in Italy. Two types of bovine *pyogenes* tested by experiments on rabbits and sheep showed pathogenic properties; subcutaneous and intramammary injections of broth-serum cultures into sheep were followed by the formation of lesions similar to those of the natural infection. The general symptoms in sheep after intravenous injection of cultures are not serious and eventually disappear. The specific changes in the mammary tissue in experiments consisted of a purulent inflammation with interstitial reaction and degenerative processes of the parenchyma.—Hans Graf (Zürich).

Cornell, R. L. (1938). **Pyogenic Infection of Goats and Sheep in Tanganyika Territory.**—*Vet. Rec.* **50.** 1653-1657. 2 figs., 1 table. [3 refs.]

An organism having the cultural, biochemical and pathogenic qualities of *Corynebacterium ovis* was isolated from abscesses in sheep and goats and from cases of caseous lymphadenitis. Artificial infection of five goats by intravenous, subcutaneous and scarification methods showed that the native breed had considerable resistance to the organism.—P. S. Watts.

Rosati, T., & Bertolino, P. (1938). La mastite gangrenosa degli ovini e caprini. [**Mastitis in Goats and Sheep due to** *Corynebacterium ovis*].—*Clin. vet., Milano.* **61.** 465-473. 4 figs. on 2 plates. [11 refs.]

The authors describe the symptoms and course of the disease as it occurs in France, Italy and Tunis, and the vaccines used for curative treatment. A formolized vaccine was used on six sheep; when exposed to infection at a later date they contracted a mild mastitis. The authors then used the vaccine on 310 affected sheep, of which all but three recovered; when it was used on a flock of 2,250 sheep the mortality was reduced from 45% to 1%. No controls were used.

Rosenwald, A. S., & Dickinson, E. M. (1939). **A Report of Swine Erysipelas in Turkeys.**—*Cornell Vet.* **29.** 61-67. [10 refs.]

The authors report three outbreaks of *Erysipelothrix rhusiopathiae* septicaemia in different flocks of turkeys in Oregon. All occurred apart from contact with pigs, but on ground used by sheep, although in a district in which no ovine erysipelas infection had been previously determined.

Six strains of the causal organism were isolated by culture under reduced oxygen tension, and their cultural and biochemical characters are detailed. No H_2S was produced; one strain reduced nitrates. The cultural tests were confirmed by antiserum protection tests in mice. Inoculation experiments in pullets, pigeons and turkeys were made with several of the strains of recovered organisms and a known strain of *E.r.*, the former appearing to be more pathogenic for poultry. A vegetative endocarditis was found in one of the pigeons on P.M. examination, but cultural tests of the lesions for *E.r.* proved negative.—C. V. W.

Grycz, E., & Książkiewicz, T. (1937). Nosicielstwo włoskowca różycy świń u gołębi po szczepieniach czynno-biernych. [**Persistence of Infection in Pigeons Inoculated with Swine Erysipelas Culture and Antiserum**].—*Pam. państ. Inst. nauk. Gosp. wiej. Puławy.* **1.** 70-75. 3 tables. [6 refs.] [French summary]. Suppl. to *Wiad. weteryn.* **16.**

Pigeons were injected intramuscularly with various doses of S.E. antiserum

on one side of the breast (0·1, 0·2, 0·25, and 0·5 c.c.), and two hours later an intramuscular injection of 0·5 c.c. of a 24-hour culture of *Erysipelothrix rhusiopathiae* was made into the other side of the breast. When the pigeons were killed, 14-36 days after infection, bacilli were found in 21 out of the 1,701 examined.

DELAPLANE, J. P., ERWIN, L. E., & STUART, H. O. (1938). **The Effect of the X Factor, of Sodium Chloride, and of the Composition of the Nutrient Media upon the Growth of the Fowl Coryza Bacillus, Hemophilus gallinarum.** —*J. agric. Res.* **56.** 919-926. 5 tables. [12 refs.]

In an investigation of the growth requirements of *H.g.* compared with those of *H. influenzae*, the authors cultured an old and a fresh strain of *H.g.* on various media containing different combinations of the factors X, V and C. A table, recording growth in yeast extract and in yeast suspension at the base of nutrient agar slopes, shows that the V and C factors in yeast extract were insufficient for growth and required the addition of blood containing the X factor. Growth tests were also made in broth containing 5% of the serum of various birds and animals, and in the same fluid media at the base of nutrient agar slopes. Several serum broths did not alone support growth, but did so when combined with a nutrient agar slope. The possible role of agar was investigated by testing growth in yeast-blood extracts and serum broths at the base of non-nutrient agar and non-nutrient 0·8% salt agar slopes. Growth occurred at the base of the non-nutrient salt agar slopes only. The given concentration of salt could thus replace the nutrients of nutrient agar in producing growth. Studies of the effect on growth of the addition of 2% NaCl to yeast-blood extract and serum broths indicated that NaCl contributed to growth but was only a partial substitute for agar.

The effect was also noted of the addition of various percentages of NaCl to 5% chicken serum broth used alone and at the base of nutrient agar. NaCl proved essential for growth in an optimum concentration of 1·5-2·0% for both the broth and agar.—R. O. MUIR.

BRANDT, H. (1938). Wuchsfaktoren und das Ammenwachstum bei Influenzabakterien. [**Growth Factors and "Nursery Growth" of Influenzal Bacteria**].—*Dtsch. tierärztl. Wschr.* **46.** 646-649. 1 table. [9 refs.]

B. claims to have shown that fresh horse blood contains a thermolabile factor which can inhibit the growth of haemophilus. Consequently, a suitable medium for the culture of members of this genus must not only contain X and V factors but must also lack the inhibitory factor. [It is not clear from the report whether the inhibitory factor is complement or not]. B. has confirmed the fact that many organisms, including *Bact. coli* and *Salmonella enteritidis*, can stimulate the growth of haemophilus on suitable medium.—E. J. PULLINGER.

RASTEGAR, R. (1938). Sur une souche de *Pasteurella* agent d'abcès enzootiques du lapin. [**Pasteurella as the Cause of Enzootic Abscesses in the Rabbit**]. —*Bull. Acad. vét. Fr.* **11.** 365-370. 1 table.

R. describes a condition in laboratory rabbits in which the animals had subcutaneous abscesses, particularly in the inferior maxillary region and in the subconjunctival connective tissue. These abscesses were usually encapsulated, but some ruptured through the skin. Some of the rabbits became extremely emaciated and died.

Pasteurella organisms isolated from the abscesses were very similar to the typical *Past. septica* strains except that they only produced indol slowly after eight days, and failed to ferment glycerin.

Experimental inoculation showed these organisms to be non-pathogenic to g. pigs, calves, sheep and goats. Intradermal and subcutaneous inoculation in rabbits reproduced the natural disease, but intravenous inoculation gave rise to fibrinous pleuro-pneumonia.—D. L. Hughes.

Foerster, W. (1938). Pasteurella-Bakterien als Krankheitserreger beim Menschen. [**Human Infection with** *Pasteurella boviseptica*].—*Klin. Wschr.* **17.** 599-603. 2 figs. [Numerous refs.]

A report of two cases of fatal chronic pneumonia in man caused by a *Pasteurella*. Cultural and serological tests and animal inoculation experiments all indicated that the organism was *Past. boviseptica*, one which has not previously been incriminated as a human pathogen. Both the above cases of infection were naturally acquired. —E. J. Pullinger.

Barboni, E. (1937). Contributo alla classificazione delle Salmonelle " Gallinarum-Pullorum ". Identificazione batteriologica di 64 ceppi isolati in Italia. [**Differentiation of Italian Strains of** *S.g.* **and** *S.p.*]—*Clin. vet., Milano.* **60.** 741-757. 4 tables. [Numerous refs.] [German summary].

Working with 64 strains of salmonella isolated in Italy, B. agrees with Pacheco and Rodrigues' classification of all the members of the *gallinarum-pullorum* group into five types [*V. B.* **8.** 416], but he arrived at such a classification by adopting a new scheme based on certain biochemical and cultural characteristics, and omitting the fermentation tests on certain carbohydrates, which were variable and unreliable. The strains were subdivided into :– Type I—*S. pullorum* with gas production, 37 ; Type II—*S. pullorum* without gas production, 9 ; Type III—*S. gallinarum* with gas production, 2 ; Type IV—*S. gallinarum* without gas production, 14, and Type V—*S. gallinarum* intermediate, 2. The strain causing bacillary white diarrhoea in turkeys in Italy belongs to Type I.—A. J. Cassar.

Hetzer, H. O. (1937). **The Genetic Basis for Resistance and Susceptibility to Salmonella Aertrycke in Mice.**—*Genetics.* **22.** 264-283. 2 figs. [Copied *verbatim* from *Anim. Breed. Abstr.* **6.** 32. Signed F. Greenshields].

Following the work of Schott, it is shown that, while resistance to the organisms of mouse typhoid does not seem to be related to age or weight, there is a strong genetic basis, and that individuals differ considerably in their capacity to transmit resistance to their offspring. ♂♂ appear to be more susceptible than ♀♀, but there is no evidence that the genes concerned are sex-linked ; in fact there is nothing indicating linkage with any of the known characters. The genetical data suggest the presence of dominants and genes which operate in a complementary fashion, and that the condition is governed by multiple characters.

—. (1938). **Report on the Meeting of Directors of Institutes and Schools of Hygiene, held at Geneva from November 22nd to 27th, 1937. [Sub-Committee on Brucellosis].**—*Bull. Hlth Org. L. o. N.* **7.** 169-190. [3 refs.]

In view of the importance of brucellosis, and in order to make a complete study of the disease, the Committee recommended that various institutes should compile records for submission to the Health Section of the League of Nations Secretariat, which would act as a central bureau. A detailed list follows of the information which should be obtained for these records, and embraces all possible sources of useful information. The list includes brucellosis of cattle, sheep, goats, pigs and horses. The Committee recommended that identical methods should be used in different laboratories in order to facilitate future discussions.—S. J. G.

Evans, S. A. (1938). **Brucella Infection : Some Further Notes.**—*Rep. Dep. vet. Sci. Tanganyika, 1937.* pp. 23-25. 1 table.

These notes were a continuation of practical observations which were made on a local infected dairy herd during 1934 and 1935 [*V. B.* **6.** 835]. A composite table condenses the observations made on a number of calves (from infected and non-infected dams), from birth to several months, and from the practical experience gained it was concluded that in a self-contained herd " one may expect the disease to reach a latent or cryptic stage. When this stage is reached, here within three years, one may expect up to 100% of viable calves to be available for drafting to clean herds after weaning ".

Jullien, J. (1937). Sur l'éclosion et la diffusion des brucelloses épizootiques. Passage possible des micro-organismes de l'humus aux invertébrés (annélides), aux végétaux à latex et aux animaux herbivores. (Notes préliminaires). [**Possibility of Passage of Brucella through Soil, Invertebrates, Plants and so back to Herbivora**].—*Bull. Acad. Méd. Paris.* **117.** 330-331. [1 ref.]

J. discusses the possibility of a cycle of infection with brucella through the infected latex of certain plants to certain annelid worms, thence to infected herbivora, and finally to man. He appears to base this theory on the fact that he has isolated a small coccus from the latex of certain Euphorbiaceae and a number of annelid worms. Unfortunately this organism has not yet been identified.

—D. L. Hughes.

—. (1938). Foreløbig meddelelse fra Veterinaerdirektøren om resultatet av bekjempelsen av smittsom kastning pr. 30-6-38. [**Result of Bovine Brucellosis Control in Norway up to June 1938**].—*Norsk VetTidsskr.* **50.** 373-378. 2 tables, 3 charts.

Tables and graphs show the progress, up to the end of June, 1938, of the control work on bovine brucellosis in Norway, in the different counties as well as in the country as a whole. The new eradication scheme had then been in operation for three and a half years.

During that space of time, 2,934 herds had been detected and notified as infected. At the end of the same period the control work had progressed so far that 2,843 herds (96·9% of the above number) harboured no positive reactors, and in 2,799 herds (95·4%) the infection is regarded as being eradicated.

There remained 135 herds (4·6%) not released from official supervision. Of these, 44 (1·5%) contained no positive reactors when the last test was performed, and in 52 herds (1·7%) the eradication work was so far advanced that in all probability they would be declared free from infection in a comparatively short time. When the last test was carried out, 91 herds proved to contain positive reactors.

The number of new herds detected and notified as infected had steadily decreased from 162 in the first quarter of 1936 to only 18 in the second quarter of 1938.—Gustav Naerland (Oslo).

Fitch, C. P., Bishop, Lucille M., & Boyd, W. L. (1937). **The Significance of Suspicious Agglutination Reactions for Bang's Disease.**—*J. Amer. vet. med. Ass.* **91.** 22-47. 7 tables. [Numerous refs.]

In these observations a suspicious reaction was taken as one in which the aggl. titre was not higher than 1:100, using the tube method and antigen recommended by the U.S. Live Stock Sanitary Association. The work described in

this paper was commenced in 1929. Altogether 86 animals were used, of which 23 had given a series of negative tests before they developed suspicious reactions; 23 others had been positive reactors, but later the titres had dropped and remained at the "suspicious" range. In 40 others the previous agglutination histories were not known. The animals under experiment were housed with 21 negative pregnant and non-pregnant heifers. Blood tests were performed monthly, and milk examinations by culture and g. pig inoculation were made every two weeks during lactation periods. Colostrum was examined after every calving and placentas ground up and mixed with saline were cultured on gentian violet plates and inoculated intraperitoneally into three g. pigs in each case. Complete records are available for each animal but were too voluminous to publish, so only five of them are dealt with in the article. Complete P.M. examinations were made in the case of ten animals, and samples from the lymph nodes, uterus, udder, spleen and liver were examined by direct culture and by g. pig inoculation. Three of the suspicious reactors became positive to the aggl. test. Two of them aborted and *Brucella abortus* were isolated from the placenta and colostrum. The other was detected in time to remove it from the herd before aborting. The first two had been positive reactors previously and one had shown a maximum titre of incomplete agglutination at 1:100. These three gave positive titres before aborting. None of the 21 in-contact animals became infected, so the authors conclude that most animals having a constant suspicious titre are not dangerous and do not spread the disease to non-infected animals.—S. J. Gilbert.

Diernhofer, K. (1938). Das Problem der Immunisierung gegen die Bruzellose. [**On Immunization against Brucellosis**].—*Dtsch. tierärztl. Wschr.* **46.** 659-661.

A general discussion of vaccination against contagious abortion, including a consideration of the use of killed vaccines, bacterial extracts and living organisms. In D's opinion the first two types of vaccine have not proved effective when subjected to critical test. Living vaccines have given better results, but their adoption has obvious disadvantages.—E. J. Pullinger.

Alessandrini, A., & Dominici, D. (1936). Osservazione epidemiologiche sull'andamento della infezione brucellare negli animali dell'Agro Romano. [**The Incidence of Brucella Infection in the District round Rome**].—*Ann. Igiene* (*sper.*), **46.** 97-113. [17 refs.]

The authors state that epizootic abortion seems to have been introduced into the Agro Romano by the importation of cattle from Lombardy and Switzerland to improve the local breeds. It is now wide-spread, mainly through ignorance of the importance of the disease and through the efforts of farmers to get rid of infected cattle by selling them. Cases are described on one farm where apparently healthy cattle from Lombardy were introduced into the herd at the end of 1932, without being examined in any way before being put with the other cattle. The first cases of abortion occurred among these cows and later among the original cows also. Five mares on the farm two of which had aborted, were also found to be infected. The animals were tested by agglutination and with Mirri's brucellin, and it was found that most of the animals that were positive to agglutination were also positive to brucellin, which gave fewer doubtful reactions. The authors therefore consider that Mirri's brucellin is an excellent diagnostic agent for brucellosis.

Biocca, E. (1938). L'infezione brucellare nelle Marche: primo focolaio epidemico. [**Brucella Infection in the Ancona Marches, Italy**].—*Ann. Igiene (sper.).* **48.** 234-238. [4 refs.]

B. states that the first epidemic form of undulant fever occurred in the Ancona Marches in June 1934. Since then the disease, which is presumed to come from infected cows, has been on the increase. He points out that the hygienic condition of the farm is bad, and emphasizes the value of eradication from the livestock. —A. J. Cassar.

Rosati, T., & di Mino, G. (1938). Su alcuni casi di orchite di natura brucellare nei caproni. [**Orchitis due to Brucella Infection in Goats**].—*Clin. vet., Milano.* **61.** 581-590. 5 figs. on 2 plates. [14 refs.]

In all cases of serious brucella infection in a herd, the male goats gave a positive reaction to a test with Mirri's brucellin. The authors examined four infected male goats during life, and the testicles of three others sent to them for examination. The animals examined during life showed no abnormal symptoms, except that in one case one testicle appeared slightly enlarged. The characteristic change found P.M. was that of interstitial inflammation, with atrophy of the gland cells. In the worst case there was calcification of the exterior and interior of the testicle. Subsequent microscopic examinations failed to reveal the presence of the organism, and the inoculation of g. pigs with material taken from affected testicles failed to produce brucella infection, except in one instance.—S. F. J. Hodgman.

Labranca, G. (1938). La differenziazione delle brucelle mediante i terreni di Petragnani al verde di malachite ed alla tionina. [**Differentiation of Brucella on Petragnani's Medium with Malachite Green and with Thionin**].—*Ann. Igiene (sper.).* **48.** 224-233. 2 tables. [15 refs.]

L. considers that Petragnani's medium with malachite green or with thionin is one of the best media for differentiating the various types of brucella. While the *abortus* group does not grow on either medium, the *melitensis* group grows on both, although the growth is more rapid and luxuriant on the malachite green medium. To obtain reliable results, however, the following precautions must be taken :– (a) during the coagulation and sterilization of the medium, the temperature should not exceed 80°C., and (b) in differentiation tests the medium should be inoculated with a loopful of a 72 hours' growth in broth culture.—A. J. Cassar.

Gräub, E., & Zschokke, W. (1938). " Gleichzeitige aktive Immunisierung gegen Rauschbrand und malignes Oedem mit abgetöteten Vollkulturen ". [**Simultaneous Active Immunization against Blackleg and Malignant Oedema with Killed Cultures**].—*Berl. tierärztl. Wschr.* April 15th. 217-218.

A criticism of the work of Frei and Riedmuller [*V. B.* **8.** 632]. The authors contend that doses of blackleg culture filtrate used by these workers (0·1-2·0 c.c. in g. pigs) are below the limit (3 c.c.) necessary for production of a solid immunity in g. pigs, and that their conclusions are therefore untenable. The effectiveness of blackleg culture filtrate as an immunizing agent, both experimentally and in practice, is stressed, and statistics are quoted in support.—H. E. Harbour.

Bennetts, H. W., & Hall, H. T. B. (1938). **Botulism of Sheep and Cattle in Western Australia : Its Cause and its Prevention by Immunization.**—*Aust. vet. J.* **14.** 105-118. 6 tables. [9 refs.]

In certain districts in Western Australia, annual losses of sheep and cattle have occurred as the result of the ingestion of material, generally rabbit carrion,

containing the toxin of *Clostridium botulinum* Type C. The sarcophagia is evident during the long, dry summer period, and because of the resultant seasonal incidence of botulism the authors elaborated control methods depending upon the inoculation of two doses of botulinum toxoid (alum-precipitated) before outbreaks are to be expected. They recommend an interval of at least two months between such inoculations, the whole procedure being repeated annually. The results of field trials indicate that although losses among unvaccinated sheep may vary from 5% to 13·2%, those among vaccinated animals are negligible. Experiments indicated that drinking water contaminated with carrion might be a source of intoxication, but there was no evidence to show that this occurred under natural conditions. The addition of 0·2% of quicklime to the toxic water used in the experiments rendered it innocuous to stock.—T. S. Gregory.

Mihailescu, M., & Ciurea, V. (1938). Sur la fermentation du saccharose par le Vibrion septique et par le B. chauvei. [**Saccharose Fermentation by** *Clostridium chauvoei* **and** *Cl. septique*].—*Arhiva vet.* **30.** 35-37. 2 tables. [2 refs.] [In French].

The action of *Cl.c.* and *Cl.s.* on saccharose was studied when the basal medium was either synthetic or meat broth, to both of which liver was added. The percentage of saccharose converted in the synthetic medium varied according to the strain from 10% to 50%, and in the broth medium from 30% to 95%. Both organisms fermented the saccharose, and there was no observable difference between them in this respect.—P. S. Watts.

Rossi, P., & Saunié, M. L. (1939). Les microbes anaérobies et notamment le Vibrion septique dans les entéro-toxémies ou ictères toxi-infectieux graves du cheval. [**Anaerobic Bacteria, especially** *Clostridium septique*, **in Enterotoxaemia and Jaundice in Horses**].—*C. R. Soc. Biol. Paris.* **130.** 511-512. [See also *V. B.* **9.** 458].

The authors discuss the importance of anaerobic infections in horses, which they say is not appreciated. They speak especially of infection with *Cl.s.*, of which ten strains were isolated from cases in horses.

Butler, E. J. (1937). *Acladium castellanii* **Pinoy and the Existence of the So-Called Acladiosis of Castellani.**—*Parasitology.* **29.** 259-265. 9 text figs., 2 figs. on 1 plate. [13 refs.]

B. quotes previous records and descriptions of *Acladium castellanii*, a human pathogen which, in the south east of Asia and Europe, and in Brazil, is the cause of an ulcerative skin infection. He describes its morphology when studied in culture on carrot, potato and agar media. He concludes that this organism is closely related to the widely distributed *Sporotrichum schenki*, the commonest cause of human and equine sporotrichosis. He also suggests that if *S. councilmani* is included in the *schenki* species, *A.c.* should also be included, and that in any case the name acladiosis should not be used to denote a separate infection; all diseases of this type should be called sporotrichosis.

Czelny, K. (1937). Badania węzłow chłonnych oraz treści jelit zdrowych koni rzeznych na obecność mikroflory tlenowcowej ze szczególnym uwzględnieniem grupy okrężnico-durowej. [**Aerobes of the Lymph Nodes and Intestinal Contents of Healthy Horses**].—*Przegl. wet.* **52.** 501-520. 9 tables. [Numerous refs.] [German summary].

Lymph nodes from 100 healthy horses after slaughter were tested for the

presence of bacteria. Out of 1,670, C. found that 1,015 (60·78%) were infected, and 655 (39·22%) free from bacteria. The following bacteria were isolated from the lymph nodes :– coliform bacilli in 103 cases, salmonella in 57 cases, Gram-positive bacilli in 832, staphylococci in 106, streptococci in 54, and sarcinae in 32.

Some details are given concerning organisms of the colon-paratyphoid group that were isolated. [No details are given concerning the results of the examination of particular regional lymph nodes, and as they stand the results recorded are of limited value].

DISEASES CAUSED BY PROTOZOAN PARASITES

Stewart, J. L. (1938). **Animal Trypanosomiasis of the Gold Coast.**—*Vet. J.* **94.** 422-425. 2 figs. on 1 plate.

Flies of the *Glossina palpalis* group are the chief disease vectors. The fly is confined in the dry season to permanent waters with low shade, but spreads over wide areas in the wet season. *G. tachinoides*, a member of the group peculiar to West Africa, is hardy, and occurs in more open country. Common trypanosomes are *Tryp. vivax*, *Tryp. congolense*, and *Tryp. brucei*. *Tryp. simiae* has caused mortality in pigs. The horse is the most susceptible domestic animal ; indigenous cattle are highly resistant, imported zebus less so. Trypanosomiasis causes dwarfism and poorness in local cattle, though its effects may be slight if grazing and watering conditions are good ; it appears to decrease resistance to rinderpest. Tartar emetic is still the most suitable curative drug for the cattle infection. In the horse it is used in conjunction with novarsenobillon in *Tryp. vivax* infection, and with novarsenobillon and naganol in *Tryp. brucei* infection. Attack on the fly by elimination of low shade on permanent streams has been effective in some areas.

—H. E. Harbour.

Hornby, H. E. (1938). **Notes on Nine Cases of *T. brucei* Infection of Cattle.**—*Rep. Dep. vet. Sci. Tanganyika, 1937.* pp. 34-35.

Tryp. brucei infection appears to be of little importance in Tanganyika as compared with *Tryp. congolense* and *Tryp. vivax* infection. H. concludes :– "Although *T. brucei* infection may be, and no doubt often is, of a transient nature in cattle, it may also be of a severe and even fatal nature. Cure appears to be easily effected with either Antrypol, Styryl 314 or Surfen C".—S. A. Evans.

Brown, A. A. F. (1938). **Trypanosomiasis Gambiensis. Some Observations in Uganda and their Bearing on Prophylaxis.**—*J. trop. Med.* (*Hyg.*). **41.** 200-207, 220-222, 234-237, 247-251, 265-270, 281-286 and 296-301. 8 figs., 1 table. [Numerous refs.]

B. describes the situation in regard to human sleeping sickness in the West Nile district of Uganda. In this area *Glossina palpalis* is confined to the immediate neighbourhood of streams, and is in constant restless movement along their courses. It appears that this tsetse is only just able to maintain its existence and has to be in constant movement to find suitable conditions. Clearings 10 yds wide along the banks of streams are sufficient to reduce the fly to a catch of ten per boy-day. It is advocated that long clearings should be undertaken, 1,000 or 2,000 yds by 10 yds, in order to prevent the movement of fly along the course of rivers, and to isolate relatively small uncleared areas in which the tsetse could be reduced by trapping and catching. Clearing should commence at the head waters of a river and proceed downwards to avoid driving the tsetse up the tributaries. Erosion

of clearings is best prevented by controlled grazing which promotes rotation of grasses and establishes creeping varieties, and thus maintains the clearings. It is also pointed out that livestock act as a biological barrier, and that instead of removing livestock from rivers for fear of attracting tsetse, they should be deliberately introduced. The erythrocyte auto-agglutination test was tried experimentally as to its value in diagnosis of infection. Of 201 persons found infected on examination of the lymph nodes, 70% were positive, 18% doubtful, and 12% negative, whereas in controls, believed free from infection, 4% were positive, 20% doubtful, and 76% negative.—U. F. Richardson.

de Camelis, F. (1936). Contributo alla conoscenza della trypanosomiasi virulenta del maiale. [**Porcine Trypanosomiasis**].—*Arch. ital. Sci. med. colon.* **17.** 185-192.

The author studied an outbreak of trypanosomiasis in pigs in the Belgian Congo, of which the symptoms were :– severe dyspnoea with a marked rise in temperature, extensive salivation and frothing, general weakness and paralysis of the limbs, and sometimes diarrhoea. Infected animals usually died the same night, but there was also a subacute form in which the course was longer and more gradual, and the animals usually recovered after about a week.

At P.M. examination the liver and spleen were congested and the mucous membrane of the stomach and intestines was reddened and congested in patches. The blood was dark red, and coagulated slowly. Trypanosomes resembling *Tryp. congolense*, *Tryp. dimorphon* and *Tryp. simiae* were found. Three healthy pigs of the same herd were infected with blood from infected pigs ; two died in three days with typical symptoms, and the same organisms were seen in their blood, but there is no mention of what happened to the third pig.

The author considers that *Tryp. dimorphon* and *Tryp. simiae* are variants of *Tryp. congolense*.

Binns, H. R. (1938). **Observations on the Behaviour in Laboratory Animals of *Trypanosoma congolense* Broden, 1904.**—*Ann. trop. Med. Parasit.* **52.** 425-430. 2 tables. [7 refs.]

B. records his observations made in connexion with inoculations of laboratory animals to obtain strains of *Tryp. congolense* for experimental investigation. The material was obtained from seven strains of *Tryp. congolense* causing disease of cattle in Nyasaland. Inoculations of rats, g. pigs, or rabbits were only made if active trypanosomes were found in fresh blood smears of the ox immediately before inoculation. The results showed that there is a considerable difference in the susceptibility of individuals to this trypanosome, and indicate that different strains of *Tryp. congolense* appear to vary enormously in pathogenicity.—M. L. Bingham.

Janssens, P. G. (1936). Contribution expérimentale à l'étude de l'influence du chauffage au bain-marie et des ondes courtes, seules ou en association chimiothérapique, sur une souche arsénorésistante de " Tr. gambiense ". [**The Effect of Heat and Short Waves, Alone or in Association with Chemotherapeutic Agents, on an Arsenic-Resistant Strain of *Tryp. gambiense***]. —*Rev. belge Sci. méd.* **8.** 400-440. 10 tables, 43 charts. [Numerous refs.]

An arsenic-resistant strain of *Tryp. gambiense* was passaged through g. pigs, and another group of g. pigs in which a non-arsenic-resistant strain was passaged was kept as a control.

To check the effect of heat on trypanosomes *in vitro*, blood was taken from the infected g. pigs when dark-ground illumination showed 4-6 parasites per field,

mixed with twice its own quantity of saline solution, and kept in a water bath for various periods at various temperatures. The trypanosomes were not affected in number or vitality by heating to 40°-43°C. for 10-15 minutes, but when heated to 44°C. or more for ten minutes, their vitality declined.

For the second series of experiments the g. pigs were exposed to several irradiations of short waves of 15-19 m. or 4 m. J. found that the administration of tryponarsyl combined with short wave irradiation did not diminish the arsenic resistance of the trypanosomes or influence the course of the infection.

ZWEMER, R. L., & CULBERTSON, J. T. (1939). **The Serum Potassium Level in *Trypanosoma equiperdum* Infection in Rats: The Rôle of Potassium in Death from this Infection.**—*Amer. J. Hyg.* Sect. C. **29.** 7-12. 1 fig., 2 tables. [16 refs.]

The authors showed that during infection of rats with *Tryp. equiperdum*, there is an increase in the serum potassium level, a decrease in the number of erythrocytes in the peripheral blood, and a lipoid depletion of the adrenal glands. The significance of these factors is discussed, and it is suggested that the elevated serum potassium may be an important factor in the cause of death. It is apparently of endogenous origin, and in view of the marked decrease of erythrocytes, may be derived from the red blood cells.—M. L. BINGHAM.

I. BOZZELLI, R. (1936). Su alcuni casi di Leishmaniosi viscerale del cane osservati in Messina. [**Canine Leishmaniasis in Messina**].—*Riv. sanit. sicil.* **24.** 869-874.

II. ANON. (1936). Leishmaniosi viscerale del cane. [**Visceral Leishmaniasis in Dogs**].—*Clin. vet., Milano.* **59.** 676-684. 3 figs.

I. The author studied the incidence of leishmaniasis in dogs brought for treatment (general patients) to the veterinary college at Messina. The cases observed were all affected with the so-called visceral form of *L. donovani* infection. The general symptoms of this form of leishmaniasis are described.

II. This is a précis of I.

I. ANDREWS, J., & MILLER, F. W. (1938). *Trichomonas foetus* **in Bulls.**—*Amer. J. Hyg.* **28.** 40-50. 1 table. [18 refs.]

II. STEWART, Helen M. (1938). **Glycogen Content of a Flagellate of Cattle, *Trichomonas foetus*.**—*Ibid.* 80-84. 1 table. [7 refs.]

III. ANDREWS, J., & VON BRAND, T. (1938). **Quantitative Studies on Glucose Consumption by Trichomonas Foetus.**—*Ibid.* 138-147. 3 tables. [7 refs.]

I. Fourteen bulls in one herd and one other bull were examined once or more during life, and three of them P.M. and *Tr.f.* was found in eight by microscopic and cultural tests.

In none could parasites consistently be demonstrated by the methods used. Best results were obtained by examination of seminal fluid, then of spermatozoa, and lastly of the washings of the sheath. The genitalia from 100 bulls after slaughter for meat were also searched for these parasites, with negative results.

In order to study the localization of infection in the genital system, one bull was anaesthetized and material taken by puncture from the testes, epididymis and seminal vesicles, all giving negative results. In this animal *Tr.f.* was only found on the penis and prepuce P.M. According to the authors' findings, infection of bulls is chronic (present during 11 months of sexual rest in one bull). Measures of control of the disease are discussed.

II. S. observed that *Tr. foetus*, stained with iodine, showed diffuse glycogen

inclusions. This article describes the relationship between the amount of glycogen present and the longevity and disappearance of *Tr.f. in vitro*, as shown by the number of motile organisms per c.c. of culture medium when examined every 12 hours and estimating proportionally those containing glycogen. The latter increased until the maximum growth was obtained, and then decreased. Death of *Tr.f.* coincided with a decrease of those containing glycogen, and was not due to an exhaustion of either carbohydrates or serum or both in the test medium (dextrose serum broth).

III. The authors studied the glucose utilization of *Tr.f.* They determined the sugar at the beginning and end of each experiment, and the daily fluctuations of organisms present. The average rate of glucose consumption was found to vary, being high (over 300 mg. per billion) during a 24-hour period in which the number of organisms was increasing, and low (under 200 mg. per billion) when they were dying out in culture.—C. V. Watkins.

I. Case, C. H., & Keefer, W. O. (1938). **Some Ways to Detect and Prevent the Spread of Trichomoniasis in Cattle.**—*J. Amer. vet. med. Ass.* **93.** 239-240. 1 fig.

II. Dikmans, A., & Poelma, L. J. (1938). **Bovine Genital Trichomoniasis with Special Reference to Diagnosis.**—*Ibid.* 362-366. [1 ref.]

III. McNutt, S. H., Blohm, F., & Barger, J. A. (1939). **Incidence of Trichomonas Foetus Infection in Iowa.**—*Vet. Med.* **34.** 40-42. 1 fig. [Num. refs.]

IV. Garlick, G. G. (1939). **Transmission of Bovine Venereal Trichomoniasis through Artificial Insemination.**—*Ibid.* 43-44.

I. Newly purchased bulls should be tested for trichomonads by being allowed to serve two or three virgin heifers. Swabs from the latter should then be examined after 12-20 days. Direct swabbing of the sheath of the bull for the collection of material is less reliable. In cases of abortion, examination of the placental fluids often leads to a positive diagnosis, but best results follow examination of the mucus at the base of the tongue of the aborted foetus.

II. The diagnosis of bovine genital trichomoniasis is usually based on the breeding history both of the individual and of the herd. Demonstration of the organism is necessary, however, to make the diagnosis complete. Immediate microscopic examination of vaginal mucus or of preputial exudate is the most direct method. Otherwise the material may be mixed with saline and a few drops of 1:40 aqueous iodine solution and sent to a laboratory for cultural examination. As a rule, *Tr. foetus* may be demonstrated with ease following early abortions, but swabs taken after 48 hours may be negative. Cows which fail to breed and in which the organisms cannot be demonstrated should be re-examined on the second day of the oestral period, when relaxation of the cervix has occurred. Chronic infections in bulls usually give negative swabs, but diagnosis may be made by examination of heifers 2-6 weeks after service by the bulls concerned, when a vaginal infection is easily demonstrable if present.

III. A survey of cows and heifers in Iowa showed the incidence of trichomonas infection to be very low. Out of 637 cows and heifers examined immediately after slaughter only four heifers were infected, and these all came from the same farm. Trichomonads occurred in the vagina only, and caused subacute vaginitis with slight nodulation. None of the 289 sows and gilts examined was infected.

IV. A description is given of two cases of transmission of trichomoniasis by semen obtained from an infected bull for artificial insemination. In the first case

a three-year-old cow which had already one normal calf failed to conceive after repeated insemination with infected semen. Autopsy failed to reveal any genital abnormality ; *Trichomonas foetus* was cultivated from the vagina, but not from the uterus. In the second case a three-year-old cow which had borne two normal calves was found to be infected with *Tr.f.* 15 days after insemination.—D. D. O.

Sniečkiene, P. (1937). Galviju kokcidijozés atsitikimas. [**Coccidosis in Cattle**]. —*Vet. ir Zootech., Kovno.* **14.** 267-270. [3 refs.]

A clinical description of cases of coccidiosis. Dosage with icthargan, 1 g. daily plus the administration of an unspecified amount of a 0·5% solution *per rectum*, is advocated.—A. Pabijanskas (Kaunas).

Lambert, F. R. (1938). L'entérite coccidienne du chien. [**Enteritis due to Coccidiosis in the Dogs**].—*Thesis, Toulouse.* pp. 84. 6 figs., 1 table. [Numerous refs.]

An excellent survey of the physiology and pathology of diarrhoea is given, together with a review of coccidia in general and the diseases they produce. Although the role of coccidia in disease is sometimes uncertain, their incidence in normal dogs, as given by various authors, varies from 3-16%. In 54 dogs with diarrhoea the authors found 35% with coccidia, in all cases *Isospora bigemina*. The predilection site is the mucous membrane of the small intestine covering Peyer's patches. In cases of persistent diarrhoea in the absence of fever, coccidiosis should be suspected and the faeces should be examined. Most harm is caused in young dogs, since the parasite is usually associated with other infections such as distemper ; older dogs carry the coccidia but show no symptoms. Treatment with a mucilaginous solution of thymol 1 g. and tannoform 2 g., together with a light milky diet, is advocated, suitable control measures being also adopted.
—S. F. Barnett.

Ray, H. N. (1938). **On the Nuclear Structure of** *Babesia bigemina* **(Smith and Kilbourne).**—*Indian J. vet. Sci.* **8.** 183-186. 5 figs. on 1 plate. [8 refs.]

R. suggests that conflicting opinions on the nuclear structure of *B.b.* have resulted from the use of dry smears stained with Romanowsky stains. Using wet smears fixed in various fixatives (Bouin, Schaudinn, Carnoy, Bouin-Duboscq-Brasil), and Feulgen's nuclear reaction, the nucleus is shown to be at the narrow apical end of the pyriform body, and to consist of a karyosome surrounded by a circlet of fine granules, arranged at the periphery of an achromatinic nuclear membrane. These facts are against the theory of flagellate origin of the parasite propounded by Dennis [(1930). *Univ. Calif. Publ. Zool.* **33.** 179]. A large granule sometimes seen at the broad end was shown by various staining methods to contain a substance allied to glycogen, and is thought to be a product of metabolic activity of the parasite and therefore variable.—H. E. Harbour.

Quin, A. H., Jr. (1938). **A Herd Condition of Swine Characterized by Icterus and Anemia.**—*J. Amer. vet. med. Ass.* **93.** pp. 327-328. [1 ref.]

Q. describes a herd disease of growing pigs characterized by splenic enlargement, generalized jaundice, and anaemia, which he considers due to a piroplasm or an anaplasm. According to Doyle [*V. B.* **5.** 127.], rickettsia-like or anaplasma-like bodies are present in the red cells. Q. suggests that further investigations are necessary.—J. A. Griffiths.

ADLER, S., & ELLENBOGEN, V. (1934). **A Note on Two New Blood Parasites of Cattle, Eperythrozoon and Bartonella.**—*J. comp. Path.* **47.** 219-221. 2 figs. [3 refs.]

The authors state that they found *Eperythrozoon*, a parasite of the red cells first observed in splenectomized mice and never before in ruminants, in the blood of a calf. The animal had been infected with *Theileria annulata*, and splenectomized a month later; three days after splenectomy a few red cells were found infected with *Eperythrozoon*. Within another six days 90% of the red cells were infected, but four days after this peak had been reached the infection disappeared. When the infection was at its height, the temperature was 40-40·6°C. In a second calf injected with blood from the first and then splenectomized, a similar condition developed. In both animals there was a marked anisocytosis. Up to 50 or 60 parasites might be found in one red cell, and clusters were occasionally found in large mononuclear leucocytes. In outline the organism resembles *E. coccoides* of mice; the authors have named it *E. wenyoni*.

Bartonella has been recorded in man, dogs, and several rodents, but not previously in ruminants. The authors found this parasite in a calf inoculated 13 days earlier with *T. annulata*, and it persisted for three days, the number of infected red cells being less than one in 1,000. The organism resembles *Bartonella muris*; the authors have named it *Bartonella sergenti*.

NIESCHULZ, O. (1938). Ueber eine Bartonella-Infektion beim Rinde. [**A Case of Bartonella Infection in Cattle**].—*Z. InfektKr. Haustiere.* **53.** 175-179. [8 refs.]

A parasitic infection, commencing 16 days after inoculation and reaching its height in 21 days, was encountered in the blood of calves inoculated with various piroplasms and anaplasms. No febrile reaction was produced, but the bartonella organism was thought to be responsible for anisocytosis. The organisms appeared as cocci or vesicular forms with a diameter of 0·3-0·5μ, either overhanging the edge of the red blood corpuscles or distributed over their circumference. They occurred singly, or as pairs or short chains. The organism is considered to belong to the genus *Bartonella* on account of its resemblance to *B. canis*, as described by REGENDANZ and REICHENOW [(1932). *Arch. Schiffs- u. Tropenhyg.* **36.** 301.], but closely resembles *Eperythrozoon wenyoni* of calves as described by ADLER and ELLENBOGEN [above]. It is considered identical with the latter, except that it belongs to the genus *Bartonella*, and should be described as *Bartonella wenyoni*.

—U. F. RICHARDSON.

KROÓ, H., & ORBANEJA, J. G. (1935). Ueber die ererbte Immunität bei der Hühnerspirochätose. [**Inherited Immunity of Fowl Spirochaetosis**].—*Z. ImmunForsch.* **86.** 224-228. 2 tables. [2 refs.] [Also appeared in *Act. dermo-sifilogr., Madr.* **28.** 235-238].

KROÓ, H., & ORBANEJA, J. G. (1935). Notiz über die Persistenz von Hühnerspirochäten im Gehirn. [**Persistence of Fowl Spirochaetes in the Brain**].—*Ibid.* 229-232. 2 tables. [8 refs.] [Also appeared in *Act. dermo-sifilogr., Madr.* **28.** 239-241.

Both the white and the yolk of eggs laid by fowls which had been infected experimentally with spirochaetes were able to destroy the infectivity of comparatively large numbers of spirochaetes. The blood serum from chicks newly hatched from similar eggs also showed a similar capacity for inactivating these organisms, whilst immune birds actually inoculated intracerebrally with spirochaetes were able to resist infection. These facts indicate that a strong heritable immunity can

be built up. On the other hand, infected chicks treated with neosalvarsan and apparently cured still harboured spirochaetes in the brain.—E. J. Pullinger.

Hungerford, T. G., & Hart, L. (1937). **Fowl Tick Fever. (*Spirochaetosis*). Also Transmitted by Common Red Mite.**—*Agric. Gaz. N.S.W.* **48.** 591-592. 1 fig.

Until recently it was considered that all outbreaks of fowl spirochaetosis in New South Wales were due to transmission of the causal organism *Treponema anserinum* by the tick *Argas persicus*. The authors present evidence that in several outbreaks the common red mite, *Dermanyssus avium*, acted as vector, no trace of ticks being found on infected premises. Laboratory tests, using healthy and infected birds, also showed that the red mite could transmit the disease.—T. S. G.

Anon. (1938). **Spirochaetosis or Tick Fever of Poultry.**—*J. Dep. Agric. Vict.* **36.** 339-342.

This is a general discussion of the life-cycles, pathogenic effects and control of *Argas persicus* and *Dermanyssus gallinae*. The epidemiology, symptoms and control of spirochaetosis are briefly outlined.—H. McL. Gordon.

I. Petersen, C. B., & Jacobsen, E. (1937). Un cas de spirochétose ictéro-hémorrhagique (maladie de Weil) vraisemblablement transmis par un chien. [**A Case of Weil's Disease in Man Presumably Transmitted by a Dog**].—*C. R. Soc. Biol. Paris.* **126.** 797-798. [8 refs.]

II. Petersen, C. B., & Jacobsen, E. (1937). Recherche sur la diffusion de la leptospirose des chiens dans un village danois. [**Weil's Disease in Dogs in a Danish Village**].—*Ibid.* 799-800. [2 refs.]

I. A case of Weil's disease in a tinsmith of 18 years of age is briefly described. The patient's blood serum reacted in a dilution of 1:300 with *L. icterohaemorrhagiae* on the eighth day of illness, and in a dilution of 1:30,000 on the 30th day. Leptospira could not be demonstrated in the urine. The patient had fondled a dog that had been ill a month previously, and the dog's serum reacted in high dilution with the specific organisms, which were demonstrated in the urine.

II. The authors examined the sera of 53 dogs in the village where the above case occurred. As a result of serological tests done, there was evidence in one-third of the dogs of present or past infection, and further latent cases were diagnosed in the following year. In many of the dogs infection was unaccompanied by symptoms, and in only one dog were typical icteric symptoms noticed. The only dog in which leptospira were demonstrable in the urine was that described in I [above], and on autopsy an interstitial nephritis was found.—D. L. Hughes.

DISEASES CAUSED BY VIRUSES

Zakrzewski, A. (1938). Polska w obliczu nowej inwazji pryszczycy. [**The Danger of Foot and Mouth Disease in Poland**].—*Przegl. wet.* **53.** 81-90. [German summary.]

Considering the necessary control measures to be taken, with special reference to Polish conditions, Z. recommends an increase in the number of railway centres suitable for disinfecting railway wagons.—V. Chládek (Prague).

Carpano, M. (1939). Sulla comparsa della febbre aftosa in Albania. [**Foot and Mouth Disease in Albania**].—*Azione vet.* **8.** 122-125. [2 refs.]

Previously Albania was free from F. & M. disease for ten years [presumably

means the last ten], but at present the disease is spreading in Yugoslavia and reaching Albania, and all animals have accordingly been withdrawn a few kilometres from the frontier.

The disease has spread from three centres in Albania: in one, 83 animals (affected animals plus in-contacts) were slaughtered, while the two other centres were dealt with by isolation.

C. describes the methods of infection, and the means of spread in Albania.

KULCZYCKI, L. (1939). Refleksje na temat przebiegu i zwalczania pryszczycy. [**Foot and Mouth Disease**].—*Przegl. wet.* **54.** 15-29. [Numerous refs.]

A general review of F. & M. disease is given. The article contains no new information.

BRIDRÉ, BARDACH, & JOLTRAIN. (1938). A propos d'un cas de contagion présumée de stomatite aphteuse de l'animal à l'homme. [**Suspected Transmission of Foot and Mouth Disease from Animals to Man**].—*Rev. Path. comp.* **38.** 1099-1101.

The authors describe a case of suspected F. & M. disease in a young man who spent a holiday on a farm where the disease was rife and drank milk from infected cows. However, his serum 20 days after the illness began was found to have no protective power for g. pigs infected with F. & M. disease virus; consequently the authors consider that the stomatitis was not due to infection with F. & M. disease.

NAKAMURA, J., WAGATUMA, S., & FUKUSHO, K. (1938). **On the Experimental Infection with Rinderpest Virus in the Rabbit. I. Some Fundamental Experiments.**—*J. Jap. Soc. vet. Sci.* **17.** 185-204 of pt. 1. 4 figs., 7 tables. [6 refs.] [In Japanese: abst. from English summary pp. 25-30 of pt. 2].

The authors claim that serial passage from rabbit to rabbit of rinderpest virus originating from virulent calf blood has always been successful in their experiments, since the blood from these rabbits was always infective to susceptible calves. No rabbits died of pure infection with rinderpest virus, and the only symptom observed was a temperature reaction, which only became evident after several passages from rabbit to rabbit. After the 166th passage in rabbits the strain remained virulent for calves. Calves immunized in this way remained resistant to virus of bovine origin. Rabbits once infected with rinderpest virus, whether it was of cattle or rabbit strain, and whether or not a thermal reaction occurred, acquired an immunity which enabled them to resist subsequent inoculation with highly virulent rabbit virus without showing any sign of infection. [See also EDWARDS, J. T. (1925). *Rep. Imp. Bact. Lab., Muktesar, 1923-24*, who reported similar experiments].

—J. A. GRIFFITHS.

KUNERT, H. (1938). Züchtung des Rinderpestvirus auf der Chorion-Allantois des Hühnerembryo. [**Culture of the Virus of Rinderpest on the Chorio-Allantoic Membrane of the Chick Embryo**].—*Dtsch. tierärztl. Wschr.* **46.** 487-490. 2 figs. [10 refs.] [See also *V. B.* **9.** 192].

A careful account of experiments carried out in Tanganyika Territory, partly at the Mpwapwa laboratory and partly in Dar-es-Salaam. Eggs were usually inoculated at the eighth day of incubation, and incubated for 5-7 days more before being opened for examination of the membranes. Membranes were examined in sterile saline in a petri dish over a dark background, and were then

shaken up with saline and glass beads to form the suspension to be used for inoculation of a further batch of eggs. Material from several passages was then tested for virulence by inoculation of susceptible calves. K. describes distinct oedematous swelling, and sometimes haemorrhages and necrotic foci in the membrane, following inoculation with rinderpest virus, and these changes, with slight variations, could be reproduced through eight passages. Material from the first passage, stored in saline and glycerin at 0°C. for two months, still produced these changes on inoculation into eggs. Smears of affected membranes from first passage eggs, stained by Paschen's method, showed in some instances a picture very similar to that of the elementary bodies of variola vaccine. This picture was never observed in later passages or in membranes from uninoculated eggs.

Interpretation of reactions following inoculations of calves was complicated by local conditions. The possibility of previous infection of the ten calves used could not be overlooked, and two cases of immediate febrile reaction following inoculation might actually have been due to infection accidentally introduced from nearby foci of the natural disease. One case was complicated by coincident trypanosomiasis. However, the results were considered to be suggestive, and to warrant further investigation. The virus was shown to remain infective on the chorio-allantois for five days, but K. was unable to conclude with certainty that there was transmission of the virus through a series of eggs, or that there was actual multiplication of the virus.—H. E. Harbour.

le Roux, G., & Tran-Ngoc-Hoan. (1939). Étude de la valeur immunigène des amygdales des veaux atteints de peste bovine expérimentale. [**Immunizing Value of the Tonsils of Calves with Experimental Rinderpest**].—*Bull. Soc. Path. exot.* **32.** 182-187. [4 refs.]

Lymph nodes and the tonsils of three calves were removed five days after the animals had been infected with rinderpest. Two vaccines were prepared, one from the lymph nodes and the other from tonsils. Three weeks later four calves were injected subcutaneously with the lymph node vaccine and four with the tonsil vaccine, in small doses, and 15 days later each received 2 c.c. of citrated virulent blood. The animals injected with tonsil material showed much less severe reactions than did those injected with the lymph node material. From this and further experiments, the authors conclude that the tonsils of calves infected with rinderpest have a marked immunogenic value, which is one and a half to three times greater than that of the lymph nodes.

Naik, R. N. (1938). **Duration of Immunity Following Goat-Virus Vaccination in Cattle.**—*Indian J. vet. Sci.* **8.** 103-112. 6 figs., 1 table.

Out of 82 animals inoculated in 1932 with rinderpest goat virus in India, four (a bullock aged nine and a half years, a cow aged ten years eight months, a buffalo cow aged eight and a half years, and a buffalo cow aged ten years) were tested for their immunity to bovine virus in 1937. In all of them the reaction to goat virus had been fever, dullness and congested mucous membranes, one having also diarrhoea. The bovine virus used in the test of immunity had been obtained four days previously from bulls at Muktesar, and was given in 2 c.c. doses. One bull, two years old and another three and a half years old, used as controls, gave temperature reactions with suspended rumination and " soft faeces " for a few days; a secondary temperature reaction followed, and *Babesia bigemina* were demonstrated in the blood of one and *Theileria mutans* in that of the other. The four animals originally tested gave no reactions.—J. A. Griffiths.

JUGE. (1938). Vaccination contre la peste bovine. **[Vaccination against Rinderpest].**—*Bull. Acad. vét. Fr.* **11.** 351-353.

J's conclusions are drawn from large-scale vaccinations in Annam. The use of tissue pulp from affected animals, *i.e.*, lymph node, spleen, and lung tissue, treated with toluene, chloroform or formol, has displaced that of the serum-virulent blood and serum-alone methods. J. states that the tissue vaccine is killed, not attenuated, and causes no systemic symptoms. Immunity takes 10-15 days to establish, and lasts less than five months. Killed virulent blood does not produce an immunity. J. states that conferring a permanent immunity by a second injection of virulent material has the same risks as serum-virus injections, and does not always result in a permanent immunity.—S. F. BARNETT.

I. CAMPBELL, A. D. (1938). **A Preliminary Note on the Experimental Reproduction of [Contagious] Bovine Pleuro-Pneumonia.**—*J. Coun. sci. industr. Res. Aust.* **11.** 103-111. 1 fig. [8 refs.]

II. CAMPBELL, A. D. (1938). **Contagious Bovine Pleuro-Pneumonia: A Report on the Use of New Antigens for the Complement-Fixation and Agglutination Tests.**—*Ibid.* 112-118. 1 fig., 1 table. [11 refs.]

III. CAMPBELL, A. D. (1938). **Contagious Bovine Pleuro-Pneumonia: A Preliminary Note on Immunity.**—*Ibid.* 119-126. 2 figs., 3 tables. [7 refs.]

I. The study of the incubation period in this disease, and of the value of methods of immunization, has been handicapped in the past by the lack of a method for experimentally reproducing the clinical picture of the disease in susceptible cattle. C. describes two methods which he found effective. In the first, 600 c.c. of fluid culture are atomized by means of a commercial paint-spray gun in an enclosed loose-box containing the susceptible animals, and infection takes place by inhalation. Of 80 animals so treated, 41 % developed clinical pleuro-pneumonia, 52 % a milder type of disease (only detected in the living animals by positive c.-f. tests), and 7 % proved refractory. Examination of these animals after death from the disease or after slaughter revealed conclusive evidence of specific thoracic infection in 92·5 %. In the second method, the disease was reproduced in all of six cattle by introducing fluid infective material into the small bronchi by means of a long rubber catheter the animals being cast and kept under restraint. The infectivity of artificially produced cases, and the incubation period are discussed.

II. C. describes a new culture-antigen which he found most satisfactory for use in the c.-f. test. It replaces the original Ebert and Peretz type of antigen prepared from pleuritic fluid, which was formerly recommended by CAMPBELL and TURNER [*V. B.* **7.** 111]. The new antigen is easier to prepare, is more constant in its properties and has a higher antigenic value and sensitivity. The preparation of a new antigen for the aggl. test is also described. Using these antigens C. found that, after exposure of cattle to atomized culture [see I, above], c.-f. antibodies were first detected between the 6th and 10th days, and agglutinins between the 9th and 12th. Following the onset of clinical symptoms, agglutinins rapidly decreased, whereas c.-f. bodies became stronger, occurring sometimes with dilutions of serum as high as 1:20,480. He concludes that the c.-f. test is an excellent method for the diagnosis of this disease and for the detection of carriers, but that the aggl. test is relatively valueless.

III. The technique described by C. for reproducing the disease experimentally [see I, above] enabled him to study the resistance to infection induced by vaccination. Resistance tests following inoculation with cultures of living organisms indicated that in order to produce a satisfactory immunity lasting 12 months or more, it was necessary to use a strain of the organism possessing a

relatively high degree of virulence. Single inoculation with such organisms provided as strong an immunity as did double inoculation. Of 51,000 head of cattle inoculated in the field with a vaccine prepared from such organisms, 1·03% developed "bad tails", and the mortality rate was 0·18%. Such ill-effects are negligible when compared with the protection afforded.—T. S. Gregory.

Seddon, H. R. (1938). **The Spread of Ephemeral Fever (Three-Day Sickness) in Australia in 1936-37.**—*Aust. vet. J.* **14.** 90-101. 3 maps. [2 refs.] Discussion pp. 101-105.

S. discusses the means by which this disease may have been introduced into Australia, suggesting that it may have come from the islands to the north as the result of the accidental introduction of insect vectors in boats trading with Australia. There was no evidence to indicate that it appeared at Darwin or near other aerodromes in the north. The spread of the disease along the north of Australia in 1936, and along the east coast as far south as Victoria in 1936-37, appeared to be linked with rainfall adequate for the breeding of insect vectors, the presence of active cases as the source of infection, and the direction of the prevailing winds. He suggests that the insect vector was probably wind-driven by the prevailing winds, with the result that the disease spread with great rapidity and, moreover, was able to cross wide areas containing few or no cattle. The lessened incidence and gradual disappearance of ephemeral fever in southern Australia also indicated that climatic influences determined its limitation.—T. S. Gregory.

I. Howitt, Beatrice F. (1938). **The Moscow 2 Strain of Equine Encephalomyelitic Virus as Compared with Other Strains of Equine Encephalitic Viruses.**—*J. infect. Dis.* **63.** 269-286. 5 charts, 4 tables. [Numerous refs.]

II. Finkelstein, H., Marx, W., Bridgers, W. H., & Beard, J. W. (1938). **Rate of Inactivation of Equine Encephalomyelitis Virus (Eastern Strain) Relative to H ion Concentration.**—*Proc. Soc. exp. Biol., N.Y.* **39.** 103-105. 1 fig. [7 refs.]

I. From the material presented, it may be assumed that the American strains of E.E. virus have a common antigenic component which may be enhanced by hyperimmunization, thus bringing out a group factor which is more noticeable in the complement-fixation test and in cross-immunity tests than in neutralization tests. Moscow 2 type of virus may at present be considered a distinct variety of these viruses, and related to other types only by its ability to produce a similar form of disease of the central nervous system in similar hosts. In most other respects it is quite distinct from the American varieties. There are differences in incubation periods, temperature curves, and clinical behaviour in g. pigs. All three strains infect the horse and the same types of experimental animals. The eastern American variety may easily infect animals when injected intradermally in minute doses, but the others are less certain to take effect in high dilutions. Moscow 2 type is more infective when given through the C.N.S. than when given by other routes, except in large doses. Virus is recoverable from the blood serum and tissues in animals infected with the American viruses; the Moscow 2 virus, however, is only recoverable from the C.N.S. and occasionally from the salivary glands.

The Russian workers found certain cross-reactions between the Moscow 2 virus and rabies virus. It resists freezing, and also resists heating for ten minutes at 70°C. It cannot be cultivated *in vitro* or on the chorio-allantoic membrane of the developing chick; it does not confer immunity on young g. pigs born of immune parents, and it is serologically and immunologically distinct from the

American strains, as shown by the c.-f. and neutralization tests and by cross-inoculation of immune animals. Brain tissue also contains certain intracytoplasmic inclusions peculiar to this form.

II. Detailed studies of pH stability and range of infectivity of plant and certain animal viruses have shown that there is a well-defined pH range where infectivity is relatively stable for a given virus.

The Eastern strain of E.E. virus seems to differ in this respect : extracts of this virus in infected embryo tissue were mixed with composite buffer solution of various degrees of pH. Mixtures tested after one hour gave similar results to other viruses studied, but tests after one week showed a maximum stability of infectivity between pH 7·5 and pH 8·5, while maximum inactivation of virus occurred between pH 5·1 and pH 5·7 : there was a similar curve in tests after one day. The possibility of an enzyme-like substance in chick embryo tissue causing inactivation of virus is suggested, since with a purified virus free of chick embryo tissue, the region of rapid inactivation between pH 5·0 and pH 6·5 is not apparent.—J. A. Griffiths.

I. Cox, H. R., Philip, C. B., Marsh, H., & Kilpatrick, J. W. (1938). **Observations Incident to an Outbreak of Equine Encephalomyelitis in the Bitterroot Valley of Western Montana.**—*J. Amer. vet. med. Ass.* **93.** 225-232. 4 figs., 3 tables. [12 refs.]

II. Eichhorn, A., & Wyckoff, R. W. G. (1938). **Immunological Studies on Equine Encephalomyelitis.**—*Ibid.* 285-290. 2 tables. [7 refs.]

I. Two strains of virus were recovered and identified as of the Western type. Fifty-seven cases occurred among 485 horses, with 20 deaths ; only two of the latter had had prophylactic serum treatment, and those only 3-4 days before the outbreak. A month after the disease had died down there was a fresh outbreak of acute disease of horses in the same area. 36 horses sickened and 31 died ; 28 of these had been vaccinated during the first outbreak. The cause of the illness was not ascertained, but the symptoms and P.M. appearances resembled the " acute liver atrophy " of equines described by Theiler [(1919). *5th and 6th Rep. Vet. Res. S. Africa.* p. 9.] in connexion with immunization of horses against African horse-sickness.

II. This paper reviews the methods of immunization and emphasizes the advantages of the chick embryo tissue vaccine as compared with horse brain vaccine. Chick embryo tissues have proved the most suitable media for the growth of E.E. virus, for when the tissues are fully diseased the virus concentration is 100,000 times more than in infected horse brain. The formalinized chick embryo virus is also more effective for immunization ; it protects against intracerebral inoculation of many fatal doses of virus. Chick vaccine is of such high potency that it can be standardized for protective value prior to use. It thus provides an effective means of control of the disease.—J. A. Griffiths.

Anon. (1938). **Equine Encephalomyelitis Virus Fatal to Children.**—*Vet. Med.* **33.** 544.

Over 20 cases of sleeping sickness in children among whom there was more than 50 % mortality were found to be due to the Eastern type of E.E. virus. All the evidence indicated mosquito transmission, for none of the children had been in contact with affected equines. The equine disease was however prevalent.

—J. A. Griffiths.

Hammersland, H. L., Herrin, H. S., & Haynes, C. F. (1938). **A Study of the Blood in Horses Infected with Infectious Anemia.**—*J. Amer. vet. med. Ass.* **93.** 320-324. 2 figs., 2 tables. [4 refs.]

Blood sedimentation in horses is more rapid in disease than in health, but this test is not diagnostic of any one disease; sedimentation rates in sick horses are said to remain high after all symptoms of the disease have subsided.

Tests with blood of 60 normal horses and 40 horses clinically recovered from equine infectious anaemia gave average readings of 18 and 26 respectively, and the authors consider the test of value in diagnosis.

Chemical tests showed a slight increase in Ca and a decrease in Fe in the blood of horses with E.I.A., and bile was also present in 39·3 % of the blood samples examined. Blood examination results are recorded in a table.—J. A. Griffiths.

Hupbauer, A., & Lugomer, V. (1938). Je li enzootska bronhopneumonija sisajuće zdrebadi virusno oboljenje? [**The Possibility that Enzootic Broncho-Pneumonia of Foals is a Virus Disease**].—*Vet. Arhiv.* **8.** 468-470. [3 refs.] [German summary]. [See also *V. B.* **9.** 171].

The authors were able to produce broncho-pneumonia in young foals following intranasal administration of a cotton-filtrate obtained from an emulsion of the lungs of foals which had died from the disease. Both clinical and P.M. findings were identical with those observed in natural cases. When a Seitz filtrate was used, mild illness developed, but no macroscopical lesions were observed P.M. The authors are of the opinion that the above disease is caused by a pneumotropic filtrable virus.—B. Oswald (Križevci).

Balozet, L. (1938). Contribution à l'étude expérimentale de la heart-water. [**Research on Heartwater**].—*Bull. Acad. vét. Fr.* **11.** 319-323.

The present article is a recapitulation and amplification of a former work by B. [see *V. B.* **6.** 809]. Heartwater virus passaged through rats is quickly attenuated and lost, but the febrile reaction evoked in rabbits occurs up to the seventh passage. Sheep which reacted to inoculation with virus passaged through laboratory animals remained susceptible to sheep-passaged virus. Serum taken at various intervals after inoculation with heartwater virus did not agglutinate *Proteus* 1, *OX* 19, *OX* 2, or *OX* K (Weil-Felix reaction). G. pigs and rats infected with heartwater virus remained susceptible to typhus and, after infection with the latter, gave a positive Weil-Felix reaction, using *Proteus OX* 19.

—H. E. Harbour.

Dayus, C. V. (1939). **" Scabby Mouth " and " Pink Eye " in Sheep. Methods of Treatment Described.**—*N.Z. J. Agric.* **58.** 215-217.

A popular article for farmers. In New Zealand the mortality from contagious ecthyma is negligible, but affected sheep may suffer a severe setback and lose condition rapidly. A vaccine prepared at the Wallaceville Veterinary Laboratory has been very successfully used to prevent the development of the disease.

—L. W. N. Fitch.

Pennacchi, L. (1936). Sulla recettività dell'epitelioma contagioso dei polli (pecora e cavallo). [**Attempts to Transmit Fowl Pox to a Horse and a Sheep**].—*Clin. vet., Milano.* **59.** 165-169. 3 figs. on 1 plate.

Material from crusts on infected fowls which produced infection in fowls within 37 hours was injected into the thickness of the cornea of a horse and a sheep, care being taken to avoid the injection of inoculum into the aqueous humour.

After a few hours there was intense lachrymation, accompanied by photophobia and a slight inflammation of the conjunctiva. Two days later, the cornea of the sheep was completely opaque and that of the horse showed a few opaque spots. Four days after injection the lachrymation and photophobia had diminished, but the eye of the sheep was still opaque, while in the horse the patches had increased so that the cornea was completely white. On the 12th day the eye of each animal was removed and a histological examination made. Inflammatory lesions were found in the outer layer of the horse's cornea, the inner layers remaining normal. The sheep's eye was practically normal, apart from a slight cellular infiltration.

I. Tang, F. F., & Wei, H. (1937). **Morphological Studies on Vaccinia Virus Cultivated in the Developing Egg.**—*J. Path. Bact.* **45.** 317-323. 10 figs. on 2 plates, 1 table. [15 refs.]

II. Rao, R. S. (1938). **Cultivation of Sheep-Pox Virus on the Chorio-Allantoic Membrane of the Chick Embryo.**—*Indian J. med. Res.* **26.** 497-504. 4 tables. [7 refs.]

I. Vaccinia virus was cultivated on the chorio-allantoic membrane for 22 generations. The virus became exalted in virulence for the chick embryo and tended to produce a gelatinous oedema in the subcutaneous tissues of rabbits.

Embryos, examined by transmitted light, and also after fixing and staining with Giemsa, showed numerous inclusion bodies. In the early stages large forms were seen, probably corresponding with Guarnieri bodies, but embedded in them were small granules which were thought to be related to Paschen bodies. In one instance a human volunteer vaccinated intradermally with egg membrane virus presented a generalized eruption.

II. Filtered sheep pox virus (gradocol membrane, A.P.S. 0·65μ) was successfully transmitted to the chorio-allantoic membrane, where it produced extensive lesions characterized by hypertrophy of the mesoderm and enormous proliferation and oedema of the ectoderm. Serial passages on the egg were secured [?9].

The initial material was not infective for rabbits or calves, but by the third passage on egg produced confluent eruptions in both species. Some indication was obtained, by cross-immunity experiments and by mixtures of virus with antisera, that the egg virus had some antigenic relationship with vaccinia.

A sheep inoculated with culture virus showed a purely local reaction and was subsequently immune. Further work will be necessary, however, to determine whether this method would be of practical value.—R. E. Glover.

Stryszak, A. S. (1937). Uwagi nad ochronno-leczniczymi szczepieniami psów przeciw wściekliznie. [**Preventive Vaccination of Dogs against Rabies**].—*Wiad. weteryn.* **16.** 365-381. [15 refs.] [German summary].

S. describes very satisfactory results obtained with the use of antirabic vaccination by Semple's and the Japanese methods. Out of 75 dogs treated, only two died. The article is mainly concerned with the problem of the large number of stray dogs in Poland which spread rabies, and S. suggests that the government should take more precautions against the infection.

I. Balozet, L. (1938). La vaccination antirabique des animaux en Tunisie du 1er janvier au 31 décembre 1937. [**Antirabies Vaccination of Animals in Tunisia in 1937**].—*Arch. Inst. Pasteur Tunis.* **27.** 241-244. 1 table.

II. Remlinger, P., & Bailly, J. (1938). La vaccination antirabique des animaux au Maroc en 1937. [**Antirabies Vaccination of Animals in Morocco**

in 1937].—*Bull. Acad. vét. Fr.* **11.** 122-130. 3 tables. [Also appeared in *Maroc méd.* **18.** 243-246].

III. Remlinger, P. (1938). Les accidents paralytiques du traitement antirabique par la méthode d'Hoegies et leur cause. [**Paralysis Following the Use of Högyes' Rabies Vaccine**].—*Maroc méd.* **18.** 123-125. 3 tables. [3 refs.]

IV. Grimpret, G. (1938). Diabète et vaccination anti-rabique chez le chien. [**Diabetes and Antirabic Vaccination in Dogs**].—*Ibid.* 247-248.

I. A table indicates the number of vaccinations with etherized virus carried out in the various districts in Tunis, and the results. None of the 552 vaccinated dogs contracted rabies; in some cases local abscesses were reported at the site of inoculation. Good results were also noted in vaccinated equines and bovines. In the town of Tunis vaccinated dogs are exempt from the municipal tax.

II. Tables are given indicating the numbers of the various animals vaccinated. Phenol vaccine is now preferred to etherized vaccine, as the former is said to keep better. The method of inoculation is described. Owing to the sensitivity of the cat to phenol, the dose at each injection must not be greater than 10 c.c.

No case of rabies occurred in the animals vaccinated, and there were no accidents due to the inoculation. Bad results obtained may be from using only a single inoculation, or from the use of improperly prepared vaccine. Poor quality commercial vaccines have been encountered. Vaccination is justified on general economic grounds, and it is suggested that regular routine vaccination of dogs in certain areas in France should be insisted upon.

III. Statistical evidence indicated that the use of Högyes' diluted brain suspension was more frequently followed by undesirable sequelae due to the vaccine than was the case with the other commonly used vaccines. The necessary dilution cannot accurately be anticipated, in view of the variation in virulence caused by passage from rabbit to rabbit.

IV. Clinical details are given of a dog which developed paresis 48 hours after a rabies vaccination, and diabetes after a second inoculation about a year later. G. considers that these complications were due to the effect of the rabies vaccination on a subject affected with chronic nephritis.—F. H. Manley.

Remlinger, P., & Bailly, J. (1938). Transmission de la rage au chien par voie vésicale. [**Transmission of Rabies to the Dog by Inoculation into the Bladder**].—*C. R. Soc. Biol. Paris.* **129.** 739-741.

In the three cases described, an exalted virus was introduced into the bladder through a catheter by means of a special syringe, precautions being taken to prevent injury to the urethra.

In each case symptoms of rabies were produced, and death ensued. In one case lesions were observed in the mucous membrane of the bladder but not in the urethra. In the other cases no signs of cystitis or urethritis were observed. It is suggested that the virus might take an upward path and be absorbed in the ureters.—F. H. Manley.

Braga, A. (1938). Sobre a ocorrencia da gastro-enterite infectuosa dos felinos. [**Infectious Gastro-Enteritis of Cats in Brazil**].—*Bol. Soc. brasil. Med. vet.* **8.** 159-170. 2 figs. on 1 plate, 1 table. [19 refs.] [French summary].

This condition is comparatively rare in Brazil and has been introduced by imported cats. Inoculation experiments on wild animals of the cat family yielded negative results. The usual symptoms and course of the disease were similar to those known in Europe.—A. H. Hunter.

PERDRAU, J. R. (1938). **Recent Research in Acute Poliomyelitis.**—*Lancet.* **235.** 905-906. [7 refs.] [See also *V. B.* **9.** 244].

Poliomyelitis virus (infantile paralysis) can only be neutralized by immune serum while it is still circulating in the blood stream. Once the virus has reached the cells of the central nervous system, antibodies cannot reach it, because these cells are bathed by cerebrospinal fluid, and under normal conditions serum globulin cannot filter through to this fluid. The only time globulin containing antibody filters through is when there is active inflammation of the C.N.S. as, for instance, when active poliomyelitis infection has taken place and thus after damage has been done. Serum therapy is therefore unsuccessful, and drug therapy also has so far been a failure. In the C.N.S. of adults there is a strong natural resistance to this disease, and a promising line of research would aim at ascertaining how the C.N.S. of the adult and juvenile differ.—E. J. PULLINGER.

TRAVASSOS, J. (1938). La tique *Amblyomma striatum*, Koch 1844 comme vecteur du "typhus exanthématique de Sao Paulo". Infection naturelle en spécimens recueillis sur des chiens, dans un foyer de la capitale (Sao Paulo). **[Natural Infection with Exanthematic Typhus in *A.s.* from Dogs in São Paulo].**—*C. R. Soc. Biol. Paris.* **127.** 1377-1380. [1 ref.]

Adult *A.s.*, recovered from apparently healthy dogs in the environs of São Paulo, were found to be infected with exanthematic typhus virus. The presence of infection was demonstrated both by allowing the ticks to feed on g. pigs and by injecting emulsions of the ticks into g. pigs. G. pigs immune to a passage strain of human exanthematic typhus virus were not susceptible.—J. MACLEOD.

PIJPER, A., & CROCKER, C. G. (1938). **Rickettsioses of South Africa.**—*S. Afr. med. J.* **12.** 613-630. 17 figs. [Numerous refs.]

The existence of three rickettsiases in man in South Africa has been established, *viz*, tick bite fever, louse typhus, and murine rat flea, or sporadic, typhus. The relationship of these rickettsiases to those of other countries has been insufficiently studied. Tick bite fever should be regarded as rickettsiasis *sui generis*, and is always associated with a primary sore from tick bite. Three species of ticks have been incriminated as carriers of the infection. The authors contend that South African epidemic typhus is not identical with the classical typhus. In sporadic typhus a virus was found which was identical with one obtained from rats. It cannot be maintained in g. pigs indefinitely, as it has a tendency to die out. G. pigs immune to it were also immune to tick bite fever, but not to epidemic typhus. —E. M. ROBINSON.

I. BURNET, F. M. (1938). **Tissue Culture of the Rickettsia of Q. Fever.**—*Aust. J. exp. Biol. med. Sci.* **16.** 219-224. 4 figs., 1 table. [10 refs.]

II. DERRICK, E. H., JOHNSON, D. W., SMITH, D. J. W., & BROWN, H. E. (1938). **The Susceptibility of the Dog to Q Fever.**—*Ibid.* 245-248. 2 figs., 1 table. [5 refs.]

I. In previous papers [*V. B.* **9.** 163.] B. and his fellow workers have described the causal organism of Q fever (a mild fever affecting man) as a rickettsia, but some authorities have subsequently expressed doubt regarding the justification for such a classification. He reports the successful cultivation of the organism in Maitland type tissue cultures and emphasizes the fact that growth occurs principally during the second week of cultivation. In this respect it is similar to the typhus rickettsia and differs strongly from viruses, nearly all of which produce a maximal titre in 48-72 hours. B. states that there is strong circumstantial evidence

that the micro-organism of Q fever is derived from an animal reservoir consisting of small native marsupials, and that it is transmitted by an arthropod. In several laboratory infections it seemed likely that the mite *Liponyssus bacoti* was responsible for transmitting the infection from experimental mice to human beings.

II. The authors have shown that fever may be produced in dogs by inoculation of emulsions of liver from g. pigs artificially infected with the rickettsia of Q fever. One experimental dog had definite fever for three days and the organism was recovered (by g. pig inoculation) from as little as 0·001 g. of its spleen. As human beings affected with Q fever have not had special association with dogs, and because of the localized distribution of the disease, it seems most unlikely that dogs and their ectoparasites play any important part in natural transmission. It is of interest to note that it has been reported from other countries that dogs are susceptible to infection with the rickettsia of epidemic and endemic typhus, boutonneuse fever and Rocky Mountain spotted fever. Dogs in Algeria and France suffer from a serious and often fatal disease due to *R. canis* which is transmitted by the tick *R. sangineus*, a parasite common in Queensland, but the work by the authors indicates that Q fever is a different disease.—T. S. Gregory.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Vaz, Z. (1935). *Cochliomyia hominivorax* agente causal de miiases em animaes domesticos do Brasil. (Caractéres que permitem distingui-la de *C. macellaria*). [*C.h.* **in Cases of Myiasis in Brazil, and its Differentiation from** *C. macellaria*].—*Rev. Biol. Hyg., S. Paulo.* **6.** 13-18. 8 figs. [Numerous refs.] [English summary].

Cochliomyia larvae taken from cases of myiasis in a pig, a dog and cattle were bred, and the adults were identified as *C.h.* V. gives a list of characteristics that will help in distinguishing *C.h.* and *C.m.*

Obitz, K. (1937). Giez bydlęcy w Polsce, jego rozmieszczenie i zwalczanie. [**Ox Warbles in Poland, their Distribution and Control**].—*Pańs. Inst. nauk. gosp. Wiejsk. Puławy.* **1.** 100-106. 1 map. [8 refs.] [English summary]. Suppl. to *Wiad. weteryn.* **16.**

O. describes the incidence of ox warbles in Poland (30-70%), giving tables for the various parts of the country and names of proprietary remedies used.

Lopes, H. de S. (1938). Sur une fausse myiase des poules produite par la larve de la Lucilia eximia Wied. (Dipt.—Calliphoridae). [**A False Fowl Myiasis Caused by Larvae of** *L.e.*]—*C. R. Soc. Biol. Paris.* **129.** 426.

Two larvae of the fly *L.e.* were found on the legs of a chicken severely infested with the sarcoptic mite *Cnemidocoptes mutans*. The larvae are believed to have been feeding only on the epithelial detritus resulting from the infestation with mites, and to be of no pathogenic significance.—J. MacLeod.

Dorman, S. C., Hale, W. C., & Hoskins, W. M. (1938). **The Laboratory Rearing of Flesh Flies and the Relations between Temperature, Diet, and Egg Production.**—*J. econ. Ent.* **31.** 44-51. 1 fig. [Numerous refs.]

The authors describe a technique for laboratory rearing of *Lucilia sericata* in large numbers on fish heads. The life-cycle occupied just under four weeks at 25°C., under three weeks at 30°C., and over five weeks at 20°C. For interruption of the life-cycle by low temperature, the prepupal stage was found to be most

suitable, eggs and pupae being adversely affected by exposures for a few days only to temperature below the threshold of development.—J. MacLeod.

I. Danelius, G., & Löfstedt, F. (1938). Behandling av inälvsparasiter hos häst. [**Treatment of Gastro-Intestinal Parasites in Horses**].—*Svensk VetTidskr.* **43.** 153-159. [5 refs.]

II. Pettersson, B. (1938). Om gastrophiluslarver hos häst. [**Gastrophilus Larvae in Horses**].—*Ibid.* 160-162.

I. Emphasis is laid on the importance of intestinal parasites in relation to horse-raising in Sweden. In addition to prophylactic measures for horse bots, the carbon bisulphide treatment on a large scale was adopted, with good results, in the Linköping district of Sweden, 1,244 horses being treated between November, 1936 and March, 1937.

II. P. discusses the disorders which *Gastrophilus* larvae may cause in the horse. A short summary of the main clinical symptoms and pathological changes is given.—Gustav Naerland (Oslo).

Nash, T. A. M. (1937). **Advice on Tsetse Surveys and Clearings.** pp. 9. Kaduna: Govt. Printer. [8vo].

This paper gives advice on the method of breaking down man-fly contact, to render tsetse harmless to man, and thus reduce the spread of human trypanosomiasis.

"Aggressive clearings", made by dealing with dry season fly sanctuaries, need expert judgment. In " defensive clearings ", the population is protected while at work by keeping the fly at a safe distance. Clearings 440 yds wide are necessary for *Glossina palpalis* and 200-300 yds wide for *G. tachinoides*. In *G. morsitans* areas it is better to remove the population when practicable. Clearing must be ruthlessly carried out and the remaining vegetation burnt when dry. The clearings must also be carefully maintained.—J. A. Griffiths.

Tobback, L. (1938). Les tiques et les moyens de les combattre. [**Ticks and Methods for their Control**].—*Propagande et Vulgarisation agricoles.* Tract No. 12. pp. 32. 3 figs., 2 tables, 1 diagram. [1 ref.] Bruxelles: Imprimerie Industrielle et Financière, S.A. [8vo] [Fr. 1].

A popular survey, for the Belgian colonies, of the principal ticks of economic importance to agriculture as vectors of disease. Control methods recommended are :– (1) burning the pastures at the end of the dry season ; (2) starving the ticks by a system of rotational grazing, each grazed section being cultivated immediately afterwards, and (3) dipping stock in arsenical washes. Dipping is recommended as a principal measure, along with which either of the other two measures may be employed. The constitution, preparation and use of arsenical dips are discussed, and details are given of the construction of dipping tanks and accessory equipment. —J. MacLeod.

Sharif, M. (1938). **Diseases Transmitted by the Indian Species of Ticks and the Possibility of their Prevention through Biological Control.**—*Indian J. vet. Sci.* **8.** 353-366. 3 appendixes. [Numerous refs.]

The tick fauna of India is represented by 11 genera and about 70 species. Ticks are found on most animals, including mammals, birds, snakes, lizards, tortoises, and also man. The most important tick species in India, together with the diseases with which they are associated, are :– *Argas persicus*, vector of the fowl spirochaete ; *Haemaphysalis bispinosa*, suspected vector of *Babesia motasi* ;

Rhipicephalus sanguineus, vector of *Babesia canis* and suspected vector of tick typhus fever and *Babesia gibsoni*; *Rh. haemaphysaloides* and *Dermacentor auratus*, suspected vectors of tick typhus fever; *Boophilus australis*, vector of *Theileria mutans*, and *Hyalomma* (*Hyalomma*) *aegyptium*, vector of *Babesia bigemina*, equine piroplasmosis due to *Babesia caballi* and *Babesia equi*, and *Th. mutans*. A list is given of 26 other species which have been found on domestic animals in India, but they are considered to be of comparatively little importance. Suggested control measures include biological control by means of *Hunterellus hookeri*.—W. Moore.

Farquharson, J., & Bly, H. (1939). **Tick Paralysis in Colorado.**—*N. Amer. Vet.* **20.** No. 2. 51-53. [9 refs.]

A note on tick paralysis caused by *Dermacentor andersoni*.—W. Moore.

Macindoe, R. H. F. (1938). **The Poultry Stickfast Flea** (*Echidnophaga Callinaceae*).—*J. Dep. Agric. S. Aust.* **41.** 732-735.

This flea has been scheduled under the provisions of the local Stock and Poultry Diseases Act. It has been found on poultry, pigeons, dogs and cats. M. discusses ways in which the flea is retained on infested premises, life-history, symptoms of infestation, and measures for control and eradication.—H. McL. G.

Cameron, D. (1938). **The Northern Fowl Mite** (*Liponyssus sylviarum* **C. & F., 1877). Investigations at Macdonald College, Que., with a Summary of Previous Work.**—*Canad. J. Res.* Sect. D. **16.** 230-254. 1 fig., 2 tables. [Numerous refs.]

C. reviews the literature on the northern fowl mite (*L.s.*). Twenty bird hosts and two mammals (man and the lemming) are recorded, and the morphology and bionomics of the mite are discussed in detail. He recommends the isolation of infested birds, the clearing of roosts, floor-boards and boxes in frosty weather, and the painting of roosts and their supports, and the lower front edges of nest boxes, with nicotine sulphate 20 minutes before the bird roosts (a single treatment). The birds come in contact with the nicotine and so rid themselves of mites; 2 oz. is sufficient for 50 birds, but all should be treated on the same evening. Single birds may be hand-treated. New birds should be quarantined.—T. W. M. C.

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Lukasiak, J. (1937). Robaki pasożytnicze u kotów w Warszawie i jej okolicach. [**Helminths of Cats in and around Warsaw**].—*Wiad. weteryn.* **16.** 321-342. 8 figs., 4 tables. [Numerous refs.] [French summary].

L. examined 65 cats from Warsaw and district and found 58 infested with helminth parasites *viz*:—the trematodes, *Opisthorchis felineus*, *Echinochasmus perfoliatus*, and *Alaria alata*; the cestodes *Diphyllobothrium latum*, *Mesocestoides lineatus*, *Dipylidium caninum*, and *Taenia taeniaeformis*, and the nematodes *Toxocara canis*, *T. mystax*, *Toxascaris leonina*, *Aleurostrongylus abstrusus*, *Ancylostoma caninum*, *Uncinaria stenocephala*, *Ollulanus tricuspis*, *Capillaria aerophila* and *Capillaria felis-cati*. He states that this is the first time that *Ollulanus tricuspis* and *Aleurostrongylus abstrusus* have been reported in Poland as parasites of cats.

I. Swales, W. E. (1936). **Some Aspects of the Sheep Parasite Problem in Quebec.**—*J. Agric., Quebec.* **40.** 33.

II. Swales, W. E. (1938). **The Policy Concerning the Control of Stomach Worms of Sheep in Eastern Canada.**—*Canad. J. comp. Med.* **2.** 289-292.

I. The author refers briefly to the stomach worm problem in Quebec,

describing and illustrating his drenching bottle for sheep and lambs. He discusses the nodular worm problem in more detail, and comments on the treatment of tapeworm infections.

II. The author notes that *Haemonchus contortus* and *Oesophagostomum columbianum* are the two most important nematodes of sheep in eastern Canada. He recommends a bluestone nicotine sulphate treatment for the former, and describes a dosing apparatus designed by himself, giving full details for dosing; no previous fasting is necessary. He states that a successful treatment for nodular disease is not yet available.—T. W. M. Cameron.

Evans, S. A. (1938). **Some Notes on Bovine Fascioliasis.**—*Rep. Dep. vet. Sci. Tanganyika, 1937.* pp. 26-27.

For the examination of faeces for liver fluke eggs the sedimentation method is regarded as better than the flotation method. Examination of specimens collected on three consecutive days was considered necessary before a negative diagnosis could be given. Carbon tetrachloride in 5 c.c. doses freshly mixed with skim milk might be considered to be a safe and fairly effective dose for the average adult zebu ox.

Living flukes were found in the liver of an ox seven years after its arrival at the laboratory farm (which is fluke-free); prior to this record three years was the longest period that flukes had been known to survive.

Marotel, & Gratecos. (1938). Apparition soudaine, en France, d'une parasitose exotique: l' "Amphistomose bovine". Urgence de l'enrayer. [**Sudden Appearance of Bovine Amphistomiasis in France**].—*Bull. Acad. Méd. Paris.* **119.** 408-410. [Also appeared in *Rev. Méd. vét., Toulouse.* **90.** 398-401].

The authors describe a disease which broke out among cattle in Meurthe-et-Moselle, clinically resembling hepatic distomatosis. Examination of the stomach, rumen and reticulum, however, revealed large numbers of worms identified as *Paramphistomum cotylophorum.* It is pointed out that this worm has hitherto only been found in Africa, Asia and America. The authors urge drastic measures to prevent a spread of this outbreak, which would appear to have originated with infected slaughter animals (*e.g.*, sheep) imported from Africa, by administration of worm treatment to all infested animals and the destruction of the intermediate hosts of the parasite (the *Bulinus* snail).

Cannon, D. G. (1938). **Some Trematode Parasites of Ducks and Geese in Eastern Canada.**—*Canad. J. Res.* Sect. D. **16.** 268-280. 9 figs., 1 table. [8 refs.]

C. describes and illustrates trematode parasites from ducks and geese. One species is new (*Stephanoprora mergi*) and two are recorded for the first time from North America (*Echinoparyphium elegans* and *Psilochasmus longicirratus*). The other species figured are *Echinostoma revolutum, Hypoderaeum conoideum, Zygocotyle lunata, Apatemon gracilis* and *Notocotylus attenuatus.*—T. W. M. Cameron.

I. Horsfall, Margery W., & Jones, Myrna F. (1937). **The Life History of *Choanotaenia infundibulum*, a Cestode Parasitic in Chickens.**—*J. Parasit.* **23.** 435-450. 6 figs., 1 table. [5 refs.]

II. Ackert, J. E., & Reid, W. M. (1937). **Age Resistance of Chickens to the Cestode *Raillietina cesticillus* (Molin).**—*Ibid.* 558.

I. Reference is first made to experimental infection by previous workers of chickens with the cysticercoid stage of *Ch.i.*, by feeding them with numbers of

three naturally infected arthropods, *viz*, the house fly, *Musca domestica*, and the two beetles, *Geotrupes sylvaticus* and *Cratacanthus dubius*.

The present authors collected and dissected miscellaneous beetles and nymphal and adult grasshoppers to see if they contained cysticercoids of *C.i.* If representative members of a single group were free, the remainder were fed tapeworm eggs by special techniques, which are described. The arthropods were killed at intervals, and if four or more apparently infective cysts were found they were fed to a chicken. A method of rearing the grasshopper *Melonoplus femurrubrum* from the egg stage for controlled experiments is described.

The following species of new intermediate hosts were determined :– the beetles *Stenocellus debilipes*, *Stenolophus conjunctus*, *Alphitophagus bifasciatus*, *Apocellus sphaericollis*, *Ataenius cognatus*, *Aphodius sp.*, and *Aphodius granarius*, and the grasshoppers *Dicromorpha viridis* and *Melanoplus femurrubrum*.

It was found by daily examination of faeces that birds passed segments of *C.i.* 13-15 days after being fed the cysts. The varying morphology of the cysticercoids in the beetle (*A. granarius*) and the grasshopper (*M. femurrubrum*) is detailed and illustrated, and the minimum time for the cysts to reach the infective stage in these hosts was determined, cross-infection experiments proving them to be the same species. Non-infective cysts have a tail, but this is lost at the infective stage.

II. The authors administered about 50 infective cysticercoids of *R.c.* to 15 chickens 20-51 days old, which resulted in an average parasitism of 4·87 worms per bird, each worm averaging 94·91 proglottids. A similar experiment with 27 birds of the same flock, but 71-150 days old, resulted in an average of 3·22 worms (averaging 79·3 proglottids) per bird.

The differences in the number of worms and their size, as judged by the average number of proglottids, in the two age groups were submitted to critical analysis and found in each case to be five times as great as the probable error. These results demonstrate that chickens about 9-20 weeks old may be much more resistant to the existence and growth of *R.c.* than are younger birds (about 4-8 weeks old) in the same flock.—C. V. Watkins.

Joyeux, C., Senevet, G., & Gros, H. (1938). Un cas de Cysticercus fasciolaris chez le lapin domestique. [*C.f.* **in the Domestic Rabbit**].—*Arch. Inst. Pasteur Algér.* **16.** 26-30. [6 refs.]

The authors describe two complete cysticerci, obtained from the liver of a rabbit; they had all the morphological features of *C.f.* Two smaller cysts from the surface of the same organ were apparently degenerate larvae of the same species. These cysticerci are most unusual in rabbits.—C. V. Watkins.

Czelny, K. (1939). Wągrzyca u ludzi i wągrzyca świń w Polsce w cświetleniu statystycznym. [**Human and Animal Cysticercosis in Poland**].—*Przegl. wet.* **54.** 110-117. 3 tables.

Statistics compiled for recent years prove that the incidence of cysticercosis in Poland has not diminished.

Talysine, T. T. (1936). Deistvie ekstrakta *Diphyllobothrium latum* (L). na motornuiu funkciju izolirovannogo tonkogo kišečnika. [**Effect of an Extract of** *D.l.* **on the Movement of the Isolated Small Intestine**].—*Pathogenic animals.* pp. 357-366. 10 figs. [5 refs.] [French summary]. Moscow : All-Union Inst. exp. Med.

T. experimented with a suspension of pulverized parasites in Ringer-Locke

solution. The strength of the solution used varied from 1:5,000 to 1:100,000, and an inhibitory action on the intestine was noticed with a concentration of 1:10,000 or more. After lavage with Ringer-Locke solution this effect disappeared, and the intestine functioned normally.

It was found that a concentration of 1:1,000 of the extract lowered the " pilocarpine tone ", even after eserine had been applied, and strengthened the contractions of the intestine. T. believes that the inhibition of the " pilocarpine tone " is caused by the action of helminthic toxins on the small intestine.

MUELLER, J. F. (1938). **The Life History of Diphyllobothrium Mansonoides Mueller, 1935, and Some Considerations with Regard to Sparganosis in the United States.**—*Amer. J. trop. Med.* **18.** 41-66. 37 figs. on 8 plates. [17 refs.]

M. describes the life-history of *D. mansonoides*, which he found in 4·6% of cats examined; he emphasizes that it is a species distinct from *D. mansoni*.

Eggs from cats hatch in 9-120 days, recent infestations in cats tending to produce the early-hatching eggs. The first intermediate hosts are various copepods including *Cyclops leuckarti*, *C. viridis*, and *C. bicuspidatus*, these becoming infested by ingestion of coracidia. These copepods seem to accelerate the hatching when placed with otherwise delayed hatching eggs. The development in cyclops resembles that of *D. mansoni*. The procercoids become mature in size after 14 days, but disintegrate in water when released from the cyclops, owing to their thin cuticle. The latter thickens and the anterior spines become more prominent from the 18th-21st day, and the parasites are then able to survive for 2-5 hours in 0·2% HCl in water. Adult copepods collected by the author in the U.S.A. were usually parasitized; nauplius larvae were very occasionally infested.

M. outlines experimental infection of second intermediate hosts, *viz*, field mice, white mice, g. pigs, white rats, cottontail rabbits, English sparrows, chickens, frogs, cats and rhesus monkeys. Only mice were regularly infested by oral administration; this occurred rarely in rabbits, g. pigs, cats and monkeys. In snakes (*Natrix*), apparently the chief second intermediate hosts, natural infestations are regularly found. Certain animals were tested for susceptibility to subcutaneous injection of procercoids, and infestation was set up in mice, rats, cats and monkeys.

Passage of spargana may be made repeatedly through mice and white rats by oral administration, the procercoids apparently undergoing no impairment in vitality; in these experiments they did not reach the adult stage, and no asexual reproduction occurred.

The domestic cat is the chief definitive host, and the dog is a definitive host to a lesser degree; the bobcat, however, is the natural host.

M. suggests that *D. mansonoides* is a probable cause of human sparganosis, especially in Florida and Texas.—C. V. WATKINS.

FRASER, A. H. H., THOMSON, W., ROBERTSON, D., & GEORGE, W. (1938). **The Influence of the Nutritional Condition of Lambs on their Susceptibility to an Artificial Infestation with Parasitic Nematodes.**—*Emp. J. exp. Agric.* **6.** 316-322. 3 tables. [5 refs.]

One half of a flock of 40 worm-free lambs 2-3 months old was fed a ration sufficient to maintain life but insufficient for normal growth. The other half received a full production ration. Appropriate management and repeated faecal examinations ensured that the lambs were free from parasites. After a month a dose of parasitic larvae was given to each lamb by stomach tube, and was repeated every two weeks until about 28,700 larvae per head had been administered. The

lambs were slaughtered 113 days after the commencement of the experiment, and the helminth content of their abomasums was determined. The average number of worms recovered from those of the ill-fed lambs was :– *Ostertagia*, 229, *Haemonchus*, 81, and *Trichostrongylus*, 3. In the well-fed group the relative numbers were :– *Ostertagia*, 11, *Haemonchus*, 2, and *Trichostrongylus*, none. It is concluded, therefore, that the level of nutrition has a profound effect on the resistance of lambs to worm infestation.—D. D. Ogilvie.

Kerr, K. B. (1938). **Studies on the Passive Transference of Acquired Resistance to the Dog Hookworm and Pig Ascaris.**—*Amer. J. Hyg.* **27.** 60-66. [7 refs.]

Serum from dogs and mice which had acquired a resistance to dog hookworm was injected into mice, followed by the oral administration of larvae. Likewise, g. pigs were given serum from g. pigs made resistant by natural infection ; they were then given ascaris eggs. Three of the hookworm experiments gave negative results ; in the other three tests done, 7 out of 17 mice survived, while 17 out of 18 controls died. In the pig ascaris experiments, three of the seven g. pigs which received " immune " serum survived, whereas six out of seven controls died. The results suggest that a humoral immune antibody is present in resistant animals. —R. Fisher.

Rayski, C. (1937). O występowaniu u psów w okolicach Warszawy gatunku *Ancylostoma caninum* (Ercolani, 1859). [*A.c.* **in Dogs around Warsaw**].—*Wiad. weteryn.* **16.** 343-349. 2 figs., 1 table. [Numerous refs.] [French summary].

R. states that *A.c.* infestation in dogs is rare in Poland. He found only three affected dogs, although numerous cases of infestation with other ancylostomes were noted. The bulk of the article consists of a review of the literature.

Parnell, I. W. (1938). **Studies on the Bionomics and Control of the Bursate Nematodes of Horses and Sheep. V. Comparisons of the Lethal Effects of some Non-Nitrogenous Fertilizers on the Free-Living Stages of Sclerostomes.**—*Canad. J. Res.* Sect. D. **16.** 73-88. 6 figs., 1 table. [Numerous refs.] [See also *V. B.* **8.** 517].

P. tested the effects of potash or calcium fertilizers on sclerostome larvae in manure under experimental conditions similar to those described in previous papers. He found that kainit would sterilize 23 times its weight of fresh manure, muriate of potash, 17 times, carbonate of potash, 13 times, and sulphate of potash, 5 times. Superphosphate was of little value, and basic slag and raw rock phosphate were useless. Lime was practically useless, although quicklime might kill if the manure was heated to charring point.—T. W. M. Cameron.

Clay, A. L. (1938). **A Note on the Prevalence and Pathogenic Importance of *Hyostrongylus rubidus* in Pigs in North Queensland.**—*Aust. vet. J.* **14.** 194-197. [8 refs.]

H.r. was present in 52·4% of pigs examined at a bacon factory in North Queensland. An outbreak was investigated at Atherton in which this parasite was present in large numbers, one mild case harbouring 1,950 worms. Associated with severe infestations were extensive haemorrhagic areas with erosion of the crests of folds of the mucous membrane, and formation of diphtheritic membranes. In the outbreak, ten clinical cases were observed, and there were three deaths ; the affected animals were about five months old. Treatment with carbon bisulphide in capsules (0·1 ml. per kg. body weight) was adopted, but apart from improvement of appetite, effects were indefinite.—H. McL. Gordon.

KWIATKOWSKA, Aniela, & MOŚCICKI, Marian. (1938). Badania statystyczne nad wystepowaniem w Polsce nicienia *Gongylonema pulchrum* (Molin 1857). [**The Occurrence of *G.p.* in Poland**].—*Wiad. weteryn.* **17.** 186-191. 4 figs., 3 tables. [10 refs.] [French summary].

A detailed description of *G.p.* is followed by results of the investigation as to its incidence in cattle in Poland. The parasite was found in 11-23% of five lots of animals totalling 542; in one locality the incidence was as high as 33%.
—V. CHLÁDEK (PRAGUE).

SAVICKIS, J. (1937). Stirnu kirmelinis plaučiu uzdegimas Lietuvoje. [**Verminous Pneumonia of Deer in Lithuania**].—*Vet. ir Zootech., Kovno.* **14.** 321-326. [German summary].

In 1937 there was a high mortality among roe deer in Lithuania, and 92·5% of those affected were young animals. Verminous pneumonia due to *Dictyocaulus viviparus* was determined as the cause of death, the bad weather of the year being a predisposing factor.—A. PABIJANSKAS (KAUNAS).

CAMERON, T. W. M. (1938). **Investigations on Trichinosis in Canada. I. A Preliminary Survey of the Incidence of *Trichinella spiralis* in Hogs in Eastern Canada.**—*Canad. J. Res.* Sect. D. **16.** 89-92. 3 tables. [2 refs.]

An examination of 729 hogs from eastern Canada revealed 15 cases of trichina infestation. All samples were examined by compression and by digestion with either pepsin or papain.

I. CULBERTSON, J. T., & KAPLAN, S. S. (1937). **Passive Immunity in Experimental Trichiniasis.**—*J. Parasit.* **23.** 560.

II. CULBERTSON, J. T., & KAPLAN, S. S. (1938). **A Study upon Passive Immunity in Experimental Trichiniasis.**—*Parasitology.* **30.** 156-166. 4 tables. [12 refs.]

I. Mice were protected against *Tr. spiralis* by injections of anti-trichinella rabbit serum. An antibody was found in the blood which appeared to act specifically against the larvae maturing in the intestine. Only 17·6% of larvae developed into adults in mice so treated, as against 36% in mice treated with normal serum and 37·1% in controls. The immune serum did not appear to act against larvae in the muscles; here the number of recovered larvae per larva fed was 44 in immunized mice and 69·9 in controls, *i.e.*, no lower than the proportion expected in animals treated with immune serum.

II. This is a fuller account of the work reported in I.

RODHAIN, J., & GILLAIN, J. (1938). Présence de nodules à Onchocerca chez un buffle du Cap dans le Haut-Ituri. [**Presence of *Onchocerca* Nodules in a Cape Buffalo in Upper Uturi**].—*Ann. Soc. belge Med. trop.* **18.** 85-88. 4 plates. [4 refs.]

After a discussion of the incidence of *Onchocerca* in bovines, the authors describe the presence of numerous onchocerci in fibrous nodules in the umbilicus of a wild buffalo. No microfilariae were found. The parasite was provisionally grouped as *O. gibsoni* from its structure, although the nodule more closely resembled *O. volvulus* of human beings. Onchocerci were not found in other buffaloes examined.—S. F. BARNETT.

IMMUNITY

Evans, S. A. (1938). **Result of Tuberculin Test of a Herd of Ankole (Sanga) Cattle from Uganda.**—*Rep. Dep. vet. Sci. Tanganyika, 1937.* pp. 25-26. 1 table.

The author was able to carry out detailed P.M. examinations on all animals tested and the results were published simply to emphasize the reliability and practical value of the tuberculin test. The high incidence of TB. in Ankole (Sanga) cattle as opposed to the negligible incidence in zebu stock in general is of interest.

Rivera, E. (1937). Ueber die intravenöse Tuberkulinisierung beim Rinde. [**The Intravenous Tuberculin Test in Bovines**].—*Inaug. Diss., Hanover.* pp. 51. 1 table, 14 charts. [12 refs.]

Tuberculin was injected intravenously in doses of 0·4 ml. into 25 cows. A positive reaction was shown by a rise of temperature beginning 1-4 hours after injection, rising to a maximum of 41°-42°C. after 5-9 hours and falling from the 9th to the 13th hour. The general disturbance was shown by acceleration of the pulse and respiration, and by shivering, etc. The reactions were controlled by intradermal tests and P.M. findings. Ten cows were positive to both tests and eight negative. Of the remaining seven, three were positive to the intravenous test and negative to the intradermal, while the reverse was the case with the other four. P.M. examinations were carried out on 14 cases and agreed with both tests in seven positive cases and in five negative cases. There was disagreement in the other two animals. R. concludes that the intravenous test is valuable as it enables a rapid diagnosis to be made.—P. S. Watts.

I. Finzi, G. (1937). L' " esotubercolina " (E.T.F.) [**Exotuberculin**].—*Profilassi.* **10.** 27-29. [3 refs.]

II. Negri, R. (1938). Sulla durata dell'attività della " Esotubercolina Finzi " (E.T.F.) [**Duration of Potency of Exotuberculin**].—*Ibid.* **11.** 87-91. 4 tables, 3 charts. [8 refs.] [French and German summaries].

III. Rogoni, A. (1938). La reazione intrapalpebrale nella diagnosi della tubercolosi bovina mediante " esotubercoline " preparate dai mezzi di Zuwerkalow-Sarkisoff e Sauton. " Valore letale " e " potere cutaneo ". [**The Intrapalpebral Exotuberculin Test for Bovine TB.**]—*Ibid.* 92-97. [15 refs.] [French, Spanish and German summaries].

I. This article is a general summary of other articles abstracted elsewhere in this bulletin [see especially *V. B.* **5.** 255; **6.** 249, 436, 527 and 600; and **7.** 406].

II. Three lots of polyvalent and mixed exotuberculin prepared in 1932, 1936 and 1938 respectively and stored [no details] in phials away from light did not in any way differ in their diagnostic properties when tested on 60 bovines of the same herd. Double doses of fresh exotuberculin had no action on animals which were not tuberculous.

III. The " intrapalpebral " test with Finzi's exotuberculin was quite reliable when it was prepared by growing tubercle bacilli either on Sauton's medium or on the potato medium of Zuwerkalow and Sarkissoff. On the other hand, subcutaneous and intramuscular tests made with exotuberculin prepared from bacilli grown on the latter medium gave unsatisfactory results; on this medium the two components of allergic tuberculins, the " cutaneous substance " and the " lethal substance " are not produced in the desired proportions. There is, in fact, a low proportion of the " lethal substance ".—Hans Graf (Zürich).

SEIBERT, Florence B., PEDERSEN, K. O., & TISELIUS, A. (1938). **Molecular Weight, Electrochemical and Biological Properties of Tuberculin Protein and Polysaccharide Molecules.**—*J. exp. Med.* **68.** 413-438. 2 text figs., 3 figs. on 1 plate, 10 tables. [Numerous refs.]

By means of sedimentation in the Svedberg ultra-centrifuge [*V. B.* **9.** 124.], and by diffusion and electrophoresis, the authors sought to determine the molecular weight and homogeneity of the tuberculin protein and polysaccharide molecules, as found in their natural state in unchanged filtrates from cultures of tubercle bacilli. The results have been compared with data obtained on fractions isolated by chemical procedures from them or from old tuberculin. The polysaccharide isolated by electrophoresis appeared to be practically the same in sedimentation and in precipitin reactions as that isolated by chemical procedure.

A practically homogeneous protein of a molecular weight of 32,000 was isolated from the culture filtrate of human tubercle bacilli by ammonium sulphate precipitation. This is thought to be an aggregate of two original molecules formed during the precipitation. This larger molecule exhibits highly antigenic properties in the precipitin reaction and produces an anaphylactic type of local skin reaction in tuberculous g. pigs, in contrast with the true tuberculin type of reaction caused by the fraction of the purified protein derivative of tuberculin.—H. V. HUGHES.

HÄNTSCH, L. (1938). Photometrische Messungen an Bakterienagglutinationen. [**Photometric Measurements of Bacterial Agglutination**].—*Z. ImmunForsch.* **93.** 154-169. 16 charts. [10 refs.]

H. describes a method of measuring with considerable accuracy the actual degree of particulation which has occurred in any agglutinating system. A Zeiss turbidimeter was used to measure changes in density in the system, and by graphing turbidimeter readings against serum dilutions, curves were constructed for various agglutinating systems (*i.e.*, various organisms and their homologous antisera). The turbidimeter reading is influenced not only by the degree of particulation but also by the shape and size of the particles formed, and it is claimed that it is possible to estimate from the curves constructed the amount of agglutinable material present in any given system.—E. J. PULLINGER.

PRÉVOT, A. R., & POCHON, J. (1938). Étude graphique des floculations à double zone des sérums anticharbonneux. [**Graphic Study of Double-Zone Flocculation in Anthrax Antisera**].—*C. R. Soc. Biol. Paris.* **127.** 1168-1170. 1 graph. [6 refs.]

The results obtained by the titration of graded volumes of anthrax antiserum with a constant amount of filtrate containing the somatic and capsular antigens are illustrated in graphical form. The authors draw analogies between their results and those obtained with tetanus. In both cases, the time of initial flocculation in each zone for filtrates of varying age were situated on two curves analogous to an equilateral hyperbola. Moreover, the constant relating the volumes of serum giving initial flocculation with the same antigen in each of the two zones was approximately 3 for tetanus and lay between 6 and 7 for anthrax.—R. O. MUIR.

SALOW, H. (1937). Ueber den Wert verschiedener Antigene bei der Serodiagnostik der Rindertuberkulose. [**Value of Various Antigens in the Complement-Fixation Test for Bovine TB.**]—*Inaug. Diss., Berlin.* pp. 26. 2 tables. [Numerous refs.]

Four groups of cows were examined by the c.-f. test using nine different antigens :– Witebsky's original antigen, its modifications by Menck and by

Paarmann, Beller's dry and wet acetone antigens, Beller's formic acid ethyl antigen (in three forms) and tuberculin. The first group comprised 51 animals in the primary stages, the second, 20 advanced cases, the third, 28 chronic cases, and the fourth, 43 negative reactors. Final diagnosis was by P.M. examination. The average figure for the detection of cases, on an average for all the above tests, was 78·4% of the first group, all of the second, and 89% of the third. Menck's method was the most satisfactory, since, though less sensitive than other modifications, it gave only 4·7 false positives. The more sensitive antigens of Beller gave a large proportion (up to 14%) of non-specific reactions.—P. S. Watts.

Love, E. L. (1938). **Preparation of Brucella Abortus Antigen and the Plate Agglutination Test.**—*Vet. Med.* **33.** 276-279. [2 refs.]

The preparation and standardization of *Br.a.* antigen for use in the rapid plate method of diagnosis are described. The strain is grown on beef-liver infusion agar (pH 7·0) for 72 hours, the collected growth washed with carbol saline, and the final suspension standardized so that 0·5 c.c. gives a centrifugal deposit of 0·5 in. depth in a Hopkins tube. Details are given for carrying out and interpreting the aggl. test.—S. J. Edwards.

Behnke, J. (1937). Die Brauchbarkeit der Schnellagglutination für die veterinärpolizeiliche Feststellung des seuchenhaften Verkalbens. [**Value of the Rapid Agglutination Test for Bovine Brucellosis**].—*Inaug. Diss., Berlin.* pp. 23. 1 table. [Numerous refs.]

By comparing the standard tube method with the rapid tests according to the technique of Huddleson and Abell and that of Donham and Fitch it was found that the latter tests were too sensitive for application in the control of contagious abortion. Of 1,040 sera tested by the Huddleson and Abell technique, 55% were positive at titres of 1:25 or over, and only 28% by the tube method ; of 1,000 sera tested by the Donham and Fitch method 43% were positive and only 8% by the tube method. All sera which were negative to the rapid test were also negative to the tube method. Therefore B. suggests that sera may first be submitted to the rapid test, and all reacting sera then verified by the tube method.—S. J. E.

Diernhofer, K. (1938). Die diagnostischen Verfahren zur Feststellung der Bruzellose. [**Diagnosis of Brucella Infection**].—*Dtsch. tierärztl. Wschr.* **46.** 677-679. [1 ref.]

A brief discussion of the methods available for the diagnosis of brucella infection in cattle, *viz*, the agglutination, Meinicke-Klärung, complement-fixation and allergic tests. [There are, of course, cultural and animal inoculation methods, but they are only applicable to individual animals and not to herds]. D. considers that of the foregoing the aggl. test is best for general use. The rapid slide aggl. test he looks upon only as a helpful adjunct to the tube test. The question of the critical diagnostic titre for aggl. tests is discussed.—E. J. Pullinger.

I. Fröhle, O. (1938). Die Brauchbarkeit der Sachweh-Reaktion zum Nachweis der Banginfektion. [**Use of the Sachweh Flocculation Test for the Diagnosis of Brucella Infection**].—*Inaug. Diss., Munich.* pp. 49. 12 tables. [Numerous refs.]

II. Rudolf, H. (1938). Erfahrungen mit der Diernhoferschen Schnellblutmethode im Laboratorium und Praxis. [**Diernhofer's Rapid Agglutination Test for Brucellosis in the Laboratory and in Practice**].—*Dtsch. tierärztl. Wschr.* **46.** 679-681. [1 ref.]

I. The Sachweh and Meinicke flocculation tests were compared with the

complement-fixation and aggl. tests on 3,509 blood samples and 261 milk samples. In 78% of the cases, all four tests agreed. Of the 856 finally considered positive, 90% were detected by the Sachweh reaction, 56% by the Meinicke, 59% by the c.-f. and only 46 by the aggl. test. It appears, however, that little attention was paid to the possibility of false positives in the various tests, and there is no evidence of *abortus* infection in the animals concerned other than that provided by the tests themselves. It is considered that part of the discrepancy may be due to the fact that the Sachweh test becomes positive before the aggl. test and remains positive after the agglutinin titre has dropped.

II. During 1937, 1,544 samples were examined by the rapid aggl. method in the field and by the ordinary aggl. tests in the laboratory. 197 of the samples positive to the rapid test were negative to the laboratory test, while 173 of those negative in the former were positive in the latter. Laboratory workers skilled in the rapid test then examined 103 cattle under field conditions and found 20 positive. These results were all confirmed by the ordinary agglutination test, and the conclusion drawn is that care is necessary to prevent false positive reactions with the rapid test. False negative reactions can only be checked by the additional use of other tests.—P. S. Watts.

Zagrodzki, K. (1937). Ujednostajniona (standart) metoda odczynu aglutynacji probówkowej przy rozpoznawaniu brucellozy bydła (ronienia zakaznego u bydła. [**Standardization of the Agglutination Test for Brucellosis**].—*Pam. pańs. Inst. nauk. Gosp. wiej. Puławy.* **1.** 15-31. 2 tables. [Numerous refs.] [French summary]. Suppl. to *Wiad. weteryn.* **16.**

Z. speaks of the routine examination of strains of *Br. abortus* to be used for the preparation of antigens for aggl. tests, with special reference to rough strains. He speaks of the preparation of an antiserum for tests of the antigen, and of the preparation of the bacillary suspension. There is nothing new in the article.

Pristojkovic, S. (1938). Agglutiniert das Hundeblut Abortus-Bang-Bakterien? [**Tests of Canine Blood for Agglutinins for Brucella**].—*Wien. tierärztl. Mschr.* **25.** 511.

The blood sera of 100 dogs, brought to be destroyed at the Vienna veterinary school, were examined for the presence of *Br. abortus* agglutinins by the rapid and the tube techniques. None reacted to the rapid method, but by the tube method seven agglutinated at a titre of 1:20, nine at 1:40 and three at 1:80. As no cultural examination was made it is not possible to say whether these agglutinins were specific for *Br.a.* or not.—S. J. Edwards.

di Aichelburg, U. (1936). Osservazioni sull'agglutinazione delle brucelle. L'agglutinazione da sali. [**Salt Agglutination of Brucella**].—*Diagn. Tec. Lab., Napoli.* **7.** 324-333. [Numerous refs.]

A. tested the agglutinability of ten S strains of *Br. abortus*, five S strains of *Br. melitensis*, and six R strains of *Br. paramelitensis* by, (a) sodium chloride and potassium sulphate (salts with monovalent cations), (b) magnesium sulphate and ammonium sulphate (salts with bivalent cations), and (c) copper sulphate (salt of a heavy metal).

In all tests the *Br.p.* strains gave much more marked agglutination than the *Br.a.* or *Br.m.* strains. *Br.p.* strains were agglutinated by 0·5% solutions of sodium chloride, and 10% solutions of potassium sulphate and upwards. But the *Br.a.* and *Br.m.* strains were only agglutinated by sodium chloride in concentrations of 20% upwards, while potassium sulphate had no effect whatever. Magnesium

sulphate and ammonium sulphate agglutinated the *Br.p.* strains in concentrations of 0·6% and 0·8% respectively and the *Br.a.* and *Br.m.* strains in 40% and 50% concentrations respectively. Copper sulphate agglutinated the *Br.p.* strains in concentrations of 0·01% upwards and the *Br.a.* and *Br.m.* strains only in saturated solutions.

Salts with monovalent and bivalent cations agglutinated all strains of all three types in very small granules which formed a soft deposit that was very easily re-emulsified. Copper sulphate produced bigger flakes, which were less easily dispersed. Agglutination usually began after 30 minutes. A. concludes that salt agglutination is a useful method for the differentiation of *Br.p.* from *Br.a.* and *Br.m.*

When suspensions were shaken with equal quantities of chloroform and left for 2-3 hours, then heated in a waterbath to drive off all remaining traces of chloroform, the brucella were found to be no longer agglutinable by sodium chloride and potassium sulphate, but the effect of the other three salts was unchanged.

Heidelberger, M., & Kendall, F. E. (1934). **Quantitative Studies on the Precipitin Reaction. The Rôle of Multiple Reactive Groups in Antigen-Antibody Union as Illustrated by an Instance of Cross-Precipitation.**—*J. exp. Med.* **59.** 519-528. 2 figs., 2 tables. [13 refs.]

Experiments are described which show that antisera to R-salt-azo-benzidine-azo-crystalline egg albumen (which had been fractionated until it was practically non-reactive with sera to crystalline egg albumen over a wide range of concentrations) give precipitates with crystalline egg albumen, by virtue, it is thought, of the specific antigenic stimulus due to the dye itself, and not as a result of the antigen being split in the animal body to form the same antibody as does egg albumen itself.

The quantitative course of the reactions is very similar for the dye-antidye and egg albumen-anti-egg albumen systems, but differs for the cross-reaction between egg albumen and antidye.

It is suggested that in this one-sided cross-reaction there may still remain in the dye-protein minor antigenic groupings common to egg albumen itself. These may be somewhat masked by the dominant azo groupings, which determine the homologous specific reaction, thus preventing the *in vitro* union of dye and anti-egg albumen.—H. V. Hughes.

I. Saenz, A. (1937). Contribution à l'étude de l'allergie et de l'immunité produites chez le cobaye par l'inoculation de bacilles tuberculeux morts enrobés dans de l'huile de vaseline. [**Allergy and Immunity Produced by the Inoculation of Tubercle Bacilli Embedded in Vaseline**].—*Rev. Immunol.* **3.** 530-541. [Numerous refs.]

II. Saenz, A. (1938). Caractères de l'allergie et de l'immunité conférées au cobaye par l'inoculation de bacilles morts enrobés dans de l'huile de vaseline. [**Allergy and Immunity Produced in Guinea Pigs by the Inoculation of Dead Tubercle Bacilli in Vaseline**].—*Ann. Inst. Pasteur.* **60.** 58-94. 5 figs., 4 tables. [Numerous refs.]

I. The author confirmed his findings that a heightened allergy to tuberculin can be demonstrated in g. pigs after they have been inoculated with mammalian tubercle bacilli suspended in vaseline [*V. B.* **8.** 162]. This allergy also occurs with avian tubercle bacilli and avian tuberculin, *Pfeifferella mallei* and mallein, *Brucella melitensis* and melitin, *Mycobacterium johnei* and johnin, and *Pasteurella pseudotuberculosis* and an extract from this organism. The intratesticular route

was better than the intrapulmonary or the intramuscular route for sensitizing the g. pigs. The increase in allergy was not paralleled by an increase in immunity, although some increase could be demonstrated.

II. This article is a repetition and an amplification of the work of S. described in I [p. 557]. For those interested, it is a good summary of the work on the subject.—D. L. Hughes.

Weinberg, M., & Kreguer, A. (1938). Préparation d'un sérum antibotulique bivalent par l'injection au cheval de toxines englobées dans la lanoline. [**Preparation of a Bivalent Botulinus Antiserum by Injection of a Horse with Toxins in Lanoline**].—*C. R. Soc. Biol. Paris.* **128.** 949-951.

A horse was hyperimmunized against *Clostridium botulinum* Type A by a series of increasing doses of culture filtrate, incorporated in lanoline, at intervals of 15 days. After bleeding, the horse was rested for a month and then similarly hyperimmunized against Type B. The Type A titre was then restored by a final injection of Type A toxin. The bivalent serum thus obtained, with an antitoxic titre of 7,500 Type A units and 1,200 Type B units, was of great therapeutic value compared with the usual *botulinus* antiserum containing 500 units.—R. O. Muir.

Freund, J., & Opie, E. L. (1938). **Sensitization and Antibody Formation with Increased Resistance to Tuberculous Infection Induced by Heat Killed Tubercle Bacilli.**—*J. exp. Med.* **68.** 273-298. 7 figs., 11 tables. [7 refs.]

The intradermal inoculation of heat-killed tubercle bacilli into a normal rabbit produces a nodule which persists for 8-12 weeks; in a sensitized rabbit a lesion is produced which ulcerates in 1-3 weeks, followed by complete healing. Sensitization is more rapid by intradermal than by intravenous or subcutaneous inoculation. Complement-fixation is demonstrable after repeated injections of heat-killed bacilli. Small doses of BCG produce a more rapid sensitization than heat-killed bacilli; this difference disappears after repeated doses. No relationship has been established between the degree of sensitization of a rabbit and its resistance to infection. In a fatal infection, sensitization disappears; in rabbits recovering from infection, skin sensitization at first decreases and then increases as recovery proceeds. The titre of complement-fixation diminishes with recovery from infection.—E. C. Hulse.

Coulaud, E. (1938). Allergie et immunité produites par les bacilles morts émulsionnés dans des huiles végétales. [**Allergy and Immunity Produced by the Inoculation of Dead Tubercle Bacilli Suspended in Vegetable Oils**]. —*Ann. Inst. Pasteur.* **61.** 355-393. 13 figs., 3 tables. [16 refs.]

Experiments usually employing 6-9 rabbits were carried out to ascertain the degree of resistance to infection given by the subcutaneous or intravenous injection of dead *Mycobacterium tuberculosis* suspended in sweet olive oil, rancid olive oil or castor oil. The results in general showed that :– (1) dead organisms suspended in these oils gave more protection when injected subcutaneously than similar organisms suspended in saline, but less than when paraffin or lanoline was the excipient; (2) that when injected intravenously, the protection afforded was equal to that produced using the paraffin excipient, and (3) that when injected intravenously the emulsion caused a broncho-pneumonia which was fatal in many cases. Photomicrographs of this condition are given.—P. S. Watts.

Gratia, A., & Goreczky, L. (1938). Das Ultrazentrifugieren der Immunkörper und der normalen bakteriziden Stoffe. [**Ultracentrifugation of Immune**

Bodies and Normal Bactericidal Substances].—*Z. ImmunForsch.* **93.** 18-26. 3 figs., 4 tables. [10 refs.]

The serum of a rabbit which had been immunized against sheep red blood corpuscles was centrifuged at about 85,000 r.p.m. for one hour. Thereafter the haemolysin and haemagglutinin titres of different layers of the centrifugate were measured and compared. The haemolysin titre of the uncentrifuged serum was 1:1,000, and after centrifugation the upper layer of the centrifugate showed a titre of 1:500 which gradually increased through the deeper layers to 1:2,000 near the bottom. In the case of the haemagglutinin, on the other hand, the original titre was 1:1,000, and after centrifugation the upper layer showed a titre of 1:900, and the bottom layer, 1:1,100. These findings are taken as evidence that the haemolysin and haemagglutinin molecules have different sizes.

When complement was centrifuged it appeared that the strongest concentration was to be found in the middle layers. It was concluded that this result was illusory due to the destruction of complement by heat in the lower layers of the centrifugate. Under the conditions of their experiments the lower layers of serum attained a temperature approaching 65°C. during centrifugation.—E. J. P.

Köves, J., & Hoffmann, F. (1937). Mennyi ideig marad a befecskendezett azérum a szervezetben ? [**The Duration of Retention of Foreign Antiserum Injected into Domestic Animals**].—*Közl. Oesszehas. élét- és kórtan Köréből.* **28.** 139-144. Numerous tables, 2 charts.

The authors injected various animals subcutaneously with potent homologous and heterologous agglutinating sera, in order to study the dispersion of the serum introduced into the organism. From time to time they determined the decrease in the amount of the agglutinin in the blood. In piglets the homologous serum decreased daily by 5%, and the heterologous by 10%. In adult pigs the dispersion was somewhat slower. In animals with a lower rate of metabolism (sheep and cattle), the decrease of the heterologous serum was 5%.—G. Sàlyi (Budapest).

Ecker, E. E. (1938). Rôle des phénomènes d'oxydation et de réduction dans l'immunologie. [**Oxidation and Reduction in Immunology**].—*Rev. Immunol.* **4.** 528-547. [Numerous refs.]

This review article analyses and co-ordinates the existing knowledge of the bearing of oxidation-reduction phenomena upon immunological problems. The relationship of these phenomena to antibody production, to bacterial toxins and the virulence of certain bacteria, and to infection in general is fully discussed. The action of large doses of vitamin C in the production of antibodies in animals is attributed to their reduction potentials, although the protective action of the vitamin against certain bacterial toxins has not been completely proved as being solely due to this reductive power. Ascorbic acid appears to play an important role in complement action in the body, and theories are reviewed as to the nature of this action, especially in relation to the part played by gluthathione, in particular the sulphydryl groups (-SH), as a link in the oxidation-reduction system. The possible nature of complement and the role of ascorbic acid in relation to anaphylaxis and hypersensitization are discussed, as is also the role of -SH groups in the antigenic specificity of certain enzymes (in particular, urease). The immunological actions of keratins are also reviewed and the difference between the reactions of oxidized keratins and those of reduced keratins seems to depend either on the groupings -S-S- or -SH acting as " determinant groupings ", or on the reduction of the -S-S- chain involving inter- or intramolecular rearrangements. Oxidation-reduction mechanisms are thus concerned in a large number of complex phenomena,

and the need is emphasized for more research leading to a fuller understanding of the many empirical observations made up to the present time. The reader is referred to the text for a more detailed exposition of the present knowledge. A full and comprehensive bibliography is given.—ALFRED EDEN.

PERAGALLO, I., & SCUTI, R. (1937). Sull'azione combinata dell-ormone sessuale maschile e della vitamina E come stimolante i processi di difesa dell'organismo negli stati infettivi. [**The Combined Action of the Male Sex Hormones and Vitamin E in Resistance to Infection**].—*Policlinico Sez. med.* **44.** 639-644. 3 figs. [5 refs.]

The authors confirmed by experiments MAGARA's theory that male sex hormones exert a protective action on mice infected with pneumococci [*V. B.* **9.** 328.], but they did not find that this action, though more apparent in male mice, was entirely specific to that sex.

In a further series of experiments, designed to determine the action of vitamin E, 10 male and 13 female mice were injected with a hormone preparation alone (testosterone); 11 males and 11 females were injected with a vitamin E preparation alone, and 8 males and 12 females were injected with a mixture of the vitamin E and testosterone, all these mice having been previously infected with one M.L.D. of pneumococci. Of the first group, 2 males and 6 females survived, of the second, 4 males and 5 females, and of the third, 5 males and 6 females.

It was concluded that vitamin E and testosterone have greater protective powers when injected together than either injected alone, and that this power is not specific to male mice. Later experiments showed that this power was effective when up to 5 M.L.D. of pneumococci were injected.

I. JACQUET, J. (1937). Contribution à l'étude de l'immunité dans les infestations intestinales par les nématodes, en relation avec le problème de leur spécificité parasitaire. [**Immunity in Intestinal Infestations with Nematodes, in Relation to their Host Specificity**].—*Thesis, Alfort.* pp. 109. [Numerous refs.]

II. JACQUET, J. (1938). Immunité et spécificité dans les infestations intestinales par les nématodes. [**Immunity and Specificity in Intestinal Nematode Infestations**].—*Cah. Méd. vét.* **8.** 57-63.

I. This is a review of the literature up to 1937 on immunity in intestinal nematode infestations. J. first classifies the various forms of immunity against these parasites by means of a table. Specificity results from a progressive adaptation of the parasites and their hosts, and is therefore subject to alteration. In abnormal hosts the development of the parasites is impossible or there is interference with egg production. Some parasites become encapsulated under such circumstances, while others reach abnormal situations. The latter parasites may be important as possible starting points for neoplastic formations.

Natural immunity generally signifies resistance to the effects of parasites and is not complete. " Age immunity " is discussed under this heading, and examples are cited.

The mechanism of acquired immunity and the effect of nutrition are summarized.

J. concludes that acquired immunity is never absolute, with a possible exception in the case of acquired immunity of rats to trichinosis.

II. A summary of I.—C. V. WATKINS.

DISEASES, GENERAL

PANISSET, L. (1938). Les maladies infectieuses des animaux transmissibles à l'homme. [**Infectious Diseases of Animals Transmissible to Man**]. pp. vii+114. 1 table, 1 photograph. Paris: Vigot Frères. [2nd Edit.] [8vo] [4s.]

This revised edition represents the author's lecture material on comparative pathology prepared for medical students at the Faculty of Medicine at Paris. The following infectious diseases are dealt with :– tuberculosis, rabies, anthrax, brucellosis, glanders, swine erysipelas, swineherd's disease, influenza, dog distemper, foot and mouth disease, diphtheria, psittacosis, spirochaetosis, equine infectious anaemia, Rift Valley fever, tularaemia, typhoid and paratyphoid, and infections transmissible by milk.—J. E.

HOPKIRK, C. S. M. (1938). **Animal Health Problems in New Zealand.**—*Rep. 1st Imp. vet. Conf. Lond., 1938.* pp. 82-86. Weybridge: Imperial Bureau of Animal Health. [5s.]

This is an account of the more important problems, and covers mastitis, sterility, Johne's disease and poultry diseases.

Mastitis is wide-spread, and may affect about half the cows in the best herds. The method of diagnosis chosen for general use is the leucocyte count of gravity cream, though the bromthymol blue test is being introduced. Staphylococci are responsible for about 30% of cases of chronic mastitis. An outline is given of the research work in progress.

Sterility, commonly temporary, causes much trouble, and appears to be of three main types, *viz*, infective and venereal, nutritional, and that due to testicular atrophy in bulls. The first type is associated with streptococcal infection, which usually clears up spontaneously; the nature of the nutritional type is obscure, as also is the case with the last type. Research is being undertaken. Johne's disease has given some trouble since 1930; since 1932 johnin tests have been carried out, and, since 1937, reactors have been slaughtered. 141 reactors were detected in 40 herds containing 2,920 cattle.

The two most important poultry diseases are coccidiosis and neurolymphomatosis.

In New Zealand, veterinary research work is carried out at Wallaceville, near Wellington, and to a small extent by veterinarians attached to Massey and Canterbury agricultural colleges. Plans to extend the work are outlined.—J. E.

DALLING, T. (1938). **A Review of Some Recent Contributions to Disease Problems of Domesticated Animals.**—*Proc. R. Soc. Med.* **32.** 59-70.

ANAEROBIC INFECTIONS.—The diseases caused by *Cl. chauvoei*, *Cl. septique*, *Cl. welchii*, *Cl. oedematiens*, *Cl. botulinum*, and *Cl. tetani* are reviewed. HENDERSON'S work on immunization against anaerobes, using formalinized whole cultures, was referred to. It was pointed out that work on lamb dysentery and other sheep diseases in this country and Australasia revealed important differences within the *Cl. welchii* group, regarded as a single group until 1922.

VIRUS INFECTIONS.—Recent work on the subject of immunization against virus diseases was dealt with, mention being made of the work of LAIDLAW and DUNKIN and of the author himself on distemper. The use of formalinized tissue containing virus in the prevention of louping-ill in sheep and rinderpest was discussed.

Other research referred to was (a) the alteration of African horse-sickness virus by passage through mouse brain to render it innocuous to horses while it is

still capable of producing immunity, (b) the work of GALLOWAY on filtration and measurement of viruses, and (c) the work of BURNET on the cultivation of viruses in the chorio-allantoic membrane of developing eggs.

DISEASES DUE TO MINERAL DEFICIENCIES.—Under this head the following conditions were considered, *viz*, milk fever, lactation tetany, anaemia in pigs, " pine " in cattle and sheep, and " swayback ".

The address concludes with a brief reference to " fowl paralysis ".—J. C. W.

ROGERS, L. (1939). **Prophylactic Inoculations against Animal Diseases in the British Empire.**—*Brit. med. J.* March 18th. 565-566. 2 tables. [2 refs.]

The article defends the value of research work carried out on animals to minimize disease. Attention is drawn to the enormous amount of suffering in animals that has been saved by preventive inoculation since Pasteur's classical experiments on preventive inoculation against anthrax in sheep. A table gives the officially recorded figures of preventive inoculation in the British Empire, during seven recent years, against five of the principal epizootics, *viz* :– rinderpest, blackleg, haemorrhagic septicaemia, contagious bovine pleuro-pneumonia, and anthrax. A total of over 51 million animals was dealt with. Short notes are given on the symptoms and causes of the diseases, and on the nature and extent of the inoculations carried out. Apart from the huge saving in severe and prolonged suffering among animals, it is estimated that the economic saving during the seven years must be between £40,000,000 and £50,000,000. Members of the medical profession are reminded of the necessity for enlightening the public on the efficacy of experiments on animals for the saving of suffering in the animal kingdom as a whole.—F. J. ANDREWS.

MOLLIN, F. E. (1937). **Disease as a Problem in Animal Production.**—*Proc. Amer. Soc. Anim. Prod. 1937.* pp. 277-286.

This is an article on the problem by a stockfarmer, from the point of view of the livestock producer. The practical difficulties of evolving disease-resistant strains of livestock are commented upon. Disease is only one of the factors causing losses ; poisonous plants, lightning, and theft play an important part in M's experience. Where disease is the chief cause, faulty nutrition and the retention of the best breeding animals beyond the economic period of usefulness makes losses more probable, not only due to disease, but also to a lowered birth rate.

—J. A. GRIFFITHS.

I. STEWART, W. L. (1935). **Research Work into Sheep and Lamb Diseases.** Alan, Duke of Northumberland Memorial Fund. pp. 27. Newcastle-upon-Tyne : Armstrong College. [8vo].

II. STEWART, W. L. (1936). **Research Work into Sheep and Lamb Diseases.** Second Report of the Management Committee. Alan, Duke of Northumberland Memorial Fund. pp. 34. 1 table, 1 graph. Newcastle-upon-Tyne : Armstrong College. [8vo].

III. STEWART, W. L. (1937). **Research Work into Sheep and Lamb Diseases.** Third Report of the Management Committee. Alan, Duke of Northumberland Memorial Fund. pp. 32. Newcastle-upon-Tyne : Armstrong College. [8vo].

IV. STEWART, W. L. (1938). **Research Work into Sheep and Lamb Diseases.** Fourth Report of the Management Committee. Alan, Duke of Northumberland Memorial Fund. pp. 39. 2 figs., 3 tables. Newcastle-upon-Tyne : King's College. [8vo].

I. The Fund was started in 1932 to conduct research into the local or semi-local diseases of sheep which constitute a permanent source of loss to agriculturists and about which existing knowledge is imperfect. A brief account is given in this first report of " cripples " in lambs. [See *V. B.* **4.** 535, and **5.** 583]. Mention is made of the increasing importance of parasitic diseases in sheep husbandry, and some of the commoner helminth infestations in the north of England are dealt with [see *V. B.* **5.** 82]. A short description is given of " pining " in sheep [see *V. B.* **6.** 451]. Other items briefly dealt with in the report are :– the method of drenching sheep, lamb dysentery, louping ill, and tick eradication.

II. Work outlined in the previous report is here dealt with more fully. Vaccine and serum treatment of lambs and ewes against lamb dysentery gave very encouraging results. For example, of 4,892 treated lambs on 17 affected farms, only 18 (0·36%) died from dysentery. On these same farms the experiment was controlled by 2,367 untreated lambs, of which 169 (7·14%) died from ascertained dysentery. Experiments carried out on " border pining " showed that parasitic infestations, threadworms and tapeworms are of great importance in the aetiology of this disease. Evidence was also obtained of the existence of a nutritional factor which acts in conjunction with the parasites in the production of pining. Chemical analyses of pining herbage indicated deficiencies in Ca, P, and Fe [*V. B.* **7.** 398]. An experiment carried out with a new anti-tick dip indicated the possibility of controlling ticks by dipping at intervals of three weeks. Dosing sheep against parasitic worms with copper sulphate and nicotine is described.

III. Work on the diseases mentioned in the previous reports has been continued. The value of serial dipping of sheep against ticks has been substantiated. An investigation is proposed into the aetiology and prevention of pregnancy disease of ewes.

IV. This reports on the continuation of the previous work in the Northumberland area. A nicotine mixture, which was introduced to overcome the main defects of the older copper sulphate for worms in sheep, is stated to give very good results. Experiments indicate that the mortality in pulpy kidney disease can be greatly reduced by the use of the specific antiserum. An extensive field investigation on border pining, not yet completed, indicates that considerable improvement in the condition of the sheep can be effected by supplementary feeding with minerals and vitamins or by routine dosing against worms, or by a combination of these methods. On farms where louping ill was reported to occur, it was found that the majority of the losses were due to septic infections, possibly arising from tick infestation. Treatment of hill sheep affected with pregnancy disease with daily injections of dextrose, calcium borogluconate, and magnesium lactate was disappointing. The necessity for adequate rations during pregnancy is stressed ; a small portable wooden silo for the preservation of grass is described, for use when artificial feeding is necessary.—N. J. Scorgie.

Peck, E. F. (1938). **Notes Relating to the Camel.**—*Vet. Rec.* **50.** 1052-1054. 2 tables.

The article consists of a few short notes on six diseases and injuries met with in camels in Somaliland, together with tables giving the results of the estimation of the haemoglobin content of the blood of ten camels.

A solution of a proprietary agent, " White Fluid " (an emulsion of tar acids and neutral hydrocarbons) is recommended for the treatment of mange.

For the treatment of traumatic keratitis, a solution of acriflavine followed by atropine, and the protection of the eye by a pad of antiphlogistine, are said to be very effective. A disease suggestive of tick paralysis is described. An immediate

application of " White Fluid " to remove ticks is recommended. A case of severe debility described was apparently caused by heavy infestation with trichostrongyles *Trichophyton* infection is commonly demonstrable in camel calves, but is easily cured.—F. J. ANDREWS.

GIRARD, G., ROBIC, J., & BUCK, G. (1938). Vaccine et piroplasmoses. **[Vaccinia and Piroplasmosis].**—*Bull. Soc. Path. exot.* **31.** 441-444. [1 ref.]

Since 1927 several cross-bred zebu-European cattle have been lost in Madagascar from piroplasmosis following inoculation with vaccinia in the hot wet season. The deaths have been eliminated by reducing the area of the inoculation, and reducing the weight of lymph gathered, from 180-200 g. to 140-145 g. Also as few animals as possible are inoculated in the hot season and a stock of lymph is kept in cold store for use in that period. The authors consider that the vaccinia lowered the resistance of the animals, with the consequence that latent piroplasmosis became acute, or alternatively that there was an increase in virulence in the strain of vaccinia virus used.—S. F. BARNETT.

GRIMPRET, G. (1938). Fièvre aphteuse et theileriose bovine. **[Foot and Mouth Disease and Bovine Theileriasis].**—*Bull. Soc. Path. exot.* **31.** 33-37. [1 ref.]

During an outbreak of F. & M. disease in Algeria a simultaneous acute theileria infection was observed. Both improved and native breeds were affected, and calves a few weeks old were liable to a fatal infection. The acute attacks of theileriasis occurred to a lesser extent in cattle which had been premunized. Owing to the co-existence of F. & M. disease, the symptoms of the theileriasis were masked, especially in calves. It is stated that gonacrine was found an effective treatment for theileria infections if applied early enough, but that it had no action on the F. & M. disease.—S. J. GILBERT.

DE KOCK, G. (1938). **Wild Animals as Carriers of Infection.**—*S. Afr. med. J.* **12.** 725-730. [19 refs.]

In the introduction, reference is made to a number of diseases in South Africa which occur in domesticated animals and have been observed in some species of wild animals. A brief reference is made to tularaemia, psittacosis and jungle yellow fever by way of analogy.

The paper is divided into three parts :– protozoan, bacterial and virus diseases. Under protozoan diseases, mention is made of the part played by the Harris trap in eradicating tsetse flies, and of the attempt to restrict the movements of game by the use of hessian screens. Under bacterial diseases the occurrence of tuberculosis in the kudu and duiker in the Albany district of the Cape Province is mentioned. Under virus diseases the role of the wildebeest (gnu) as a carrier of the virus of snotsiekte (a form of malignant catarrh) is discussed, as well as that of wild pigs as reservoirs of the virus of African swine fever. The part played by meerkats (Viverridae) as carriers of rabies is referred to. The question of game as carriers of F. & M. disease virus in South Africa is discussed and the conclusion reached that, as far as can be determined, game animals in South Africa probably do not act as carriers.—E. M. ROBINSON.

VON HEPDING, L. (1938). Umfang und Ergebnisse der Geflügeluntersuchungen in Preussen in den Jahren 1935 und 1936. **[Results of P.M. Examination of Poultry in Prussia in 1935 and 1936].**—*Arch. Geflügelk.* **12.** 129-149. 9 charts. [Numerous refs.] [English summary].

A collective report on P.M. examination of poultry in 15 Prussian Institutes

during 1935 and 1936. The chief causes of death were bacillary white diarrhoea, non-specific intestinal diseases, and coccidiosis. Next in order of frequency were :– non-specific diseases of the ovary and oviduct, intestinal parasites, leucosis, gout, tuberculosis, poisoning, etc. Compared with previous years, there were more deaths reported from TB., pullorum disease, fungous diseases, infectious coryza, leucosis, fowl paralysis, coccidiosis, stomach worms, gout, ovarian and oviduct diseases and poisoning. There was a fall in the number of deaths from fowl plague and fowl cholera, *Salmonella enteritidis* infection, *Bact. coli* infection, non-specific intestinal diseases and non-specific diseases of the respiratory system.
—Sassenhoff (Munich).

Swales, W. E. (1936). **Two Important Diseases of Ducks in Quebec.**—*J. Agric., Quebec.* **39.** 40-43.

S. discusses duck malaria and the duck stomach worm (*Tetrameres crami*). Duck malaria due to *Leucocytozoon anatis* is common in Quebec, being carried by *Simulium venustus*. It strikes suddenly, infected ducklings dying within a day of the appearance of symptoms. Control depends on the removal of nesting ducks from the vicinity of running water, and isolating them in a screened outhouse from May to July. The stomach worm is carried by fresh-water amphipods, and does considerable local damage. No curative treatment is known, and the keeping of fish is suggested as a means of removing the carriers and so preventing disease.
—T. W. M. Cameron.

Landauer, W. (1937). **Loss of Body Heat and Disease.**—*Amer. J. med. Sci.* **194.** 667-674. [Numerous refs.]

An account is given of studies of frizzle fowls, showing that the evolution of many structural and physiological disturbances involves a chain of events constituted by interactions between environment and organism, with consequent internal adjustment.

The abnormalities of frizzle fowls bear a striking resemblance to the symptoms of Graves' disease. The only trait under immediate gene control is the plumage peculiarity ; the other changes are all secondary. Most of the manifestations are simply reactions to environmental temperature. At a low temperature metabolism reaches its highest peak in frizzle fowls. The thyroid, however, cannot maintain the requisite high level of production, and adaptations and readjustments follow. Under extreme conditions " structural disruption " may occur, leading to death.

The work affords further evidence of the profound influence of environment upon the body.—D. D. Ogilvie.

Henschen, F. (1938). Kärlendotelets roll vid patologiska processer. [**The Role Played by Vascular Endothelium in Pathological Processes**].—*Skand. VetTidskr.* **28.** 393-408. 9 text figs., 5 figs. on 3 plates. [English summary].

H. gives a brief account of the role played by the reticulo-endothelial system in pathological conditions, with particular attention to the vascular endothelium. Brief mention is made of the reactive processes of the R.E.S. in pathological conditions of metabolic origin, such as disturbances of the protein, lipoid or carbohydrate metabolism, and of its function in relation to the formation and destruction of the blood corpuscles, production of bile pigments, and production of antibodies.

Thrombus formation is briefly reviewed, together with the role played by the vascular endothelium ; the proliferative, thrombopoietic endovascularitis as seen in processes of chronic inflammation accompanied by distended blood vessels and stagnation of the blood stream is dealt with, and endothelial tumours in general

are mentioned. In the discussion that followed HJÄRRE maintained that infectious anaemia in the horse ought to be grouped with the leucoses and endothelioses, a view which was strongly supported by the author.—GUSTAV NAERLAND (OSLO).

ERIKSSON, K. (1938). Aerftlighetsundersökningar av genital-hypoplasi hos nötkreatur. [**Investigations Respecting the Heredity of Genital Hypoplasia in Cattle**].—*Skand. VetTidskr.* **28.** 419-423. 4 figs., 4 tables. [English summary].

Hypoplasia of the reproductive glands—testes of the male and ovaries of the female—causing decreased fertility or eventually total sterility occurs frequently in the Swedish highland race of cattle. The undersized condition of the glands is most frequently one-sided. In calves, especially males, the condition may be recognized shortly after birth, or in any case at puberty, whereas the females must have reached the age of 6-8 months, when rectal exploration is possible, before the exact diagnosis can be made. In 2,100 head of cattle examined, hypoplasia of the left testis or ovary was found in about 25%, of the right, in about 1%, and in both left and right, in 4-5%. 19·3% of the breeding bulls and 18·2% of the breeding cows examined were thus affected.

It is the generative tissues of the glands that are involved. The one-sided affection usually leads to decreased fertility; when it is double-sided there is total sterility. The condition is congenital and has been shown to be of a hereditary nature. A study of the mode of transmission suggested that it might be dependent on two recessive genetic factors.—GUSTAV NAERLAND (OSLO).

KEMP, T. (1938). **Heredity and the Endocrine Function. An Investigation of Hereditary Anterior Pituitary Deficiency in the Mouse.**—*Acta path. microbiol. scand.* Suppl. No. 37. pp. 290-305. 12 figs., 3 tables. [10 refs.] [In English].

Previous work on hereditary dwarfism in mice is discussed. Using a strain of black silver mice, originally imported from England into the U.S.A. and from there to Denmark, it had been shown that a gene responsible for anterior pituitary deficiency, and so for the dwarfism, can readily be transferred to other strains of mice, and that it retains all its characters as a recessive gene. The experiments now described by K. were carried out on crosses between the old American strain and a new strain from Germany of wild mice with hereditary dwarfism. Estimation of the standard metabolism of dwarf mice showed that it was about 60% that of normal mice, a condition similar to that found in myxoedema.

The action of gonadotropic hormones on the gonads of adult male dwarf mice is described. The author used a hormone from human urine of pregnancy, which contains no gonadotropic hormone of hypophyseal type, and a hormone from pregnant mare serum, which is chiefly of the hypophyseal type. The effect of both types on testes and secondary sex organs was usually pronounced. The chorionic hormone (from human urine) acted chiefly on the testicular cells, whereas the hormone from mare serum had profound action on the seminiferous tubules as well as on the interstitial cells.—F. J. ANDREWS.

I. COCA, A. F. (1938). **A Discussion of Food and Contact Allergies, with Special Reference to their Experimental and Possibly Natural Occurrence in Lower Animals.**—*Cornell Vet.* **28.** 136-141. [1 ref.]

II. MILKS, H. J. (1938). **The Role of Allergy in Skin Diseases of Dogs.**—*Ibid.* 142-148. [4 refs.]

III. CORWIN, L. A., & DESSON, L. J. (1938). **General Discussion of Allergic**

Conditions of Animals with Special Reference to Manifestations.—*Ibid.* 149-151.

I. In an attempt to discover the cause of a canine dermatitis of unknown aetiology, the available facts of the cutaneous manifestations of anaphylaxis and allergy in man and lower animals are discussed.

The dermatitis could not be traced to a purely anaphylactic origin, nor could it be identified with the type of familial infantile eczema which is due to food sensitivity. Fagopyrism, a form of photosensitization due to various plant foods, may, however, be a causative factor. The possible relationship of the disease to the contact dermatitis of allergic origin which has been artificially induced in laboratory animals is also worthy of consideration.

II. A general survey of the phenomena of allergy revealed that certain dogs are undoubtedly sensitive to certain foods, and afford reactions manifested by urticaria and erythema.

M. describes a seasonal dermatitis of dogs occurring mostly in summer and autumn, and characterized by pruritus, with thickening and depilation of the skin of the back. It is suggested that the condition may be of allergic origin, and that the sensitizing factors dwell in the diet proteins. The possibility that external irritants may possess aetiological significance is also discussed, but no really conclusive evidence of causation is furnished.

III. In a discussion of summer eczema of dogs and its aetiology, it is suggested that unnatural environment may lead to interference with the eliminative functions, dispose to auto-intoxication, and hence create the disease. Another theory of causation is based on the supposition that most canine diets are deficient in fat, and a fat-rich diet is advocated for correction. Two unusual cases of summer eczema are described. In one, there was no recurrence of the disease after accidental poisoning with thallium sulphate. In the other, ovaro-hysterectomy for pyometritis apparently cured the condition, and acted as a prophylactic to it during subsequent seasons.—D. D. Ogilvie.

Stockklausner. (1938). Die Zuchtschäden vom züchterischen Standpunkt betrachtet. [**Breeding Losses from the Point of View of the Breeder**].—*Dtsch. tierärztl. Wschr.* **46.** 756-758.

Illness in young stock due to feeding excess protein or to mineral and vitamin deficiencies is common. Feeding the dam on acid foods will also affect the sucking young. Experimentally, mineral deficiencies are known to cause sterility, but in practice little is known regarding the significance of this factor. The practice of treating all cases of sterility with mineral supplements indiscriminately is condemned. Reports on the use of vitamin E are inconclusive; there is said to be some indication that treatment with vitamin E may influence the course of *Brucella abortus* infection, and reduce the number of abortions. Owing to lack of experimental evidence, the whole subject of diet in relation to sterility is obscured by vague theorizing.

S. studied large numbers of herd books and found that in Germany the average length of life of cows of high and low milking capacity was the same. Cows are eliminated from herds mainly on account of sterility, and the conclusion is drawn that there is no direct relation between high milking capacity and infertility.

—A. T. Phillipson.

Polovceva, V. V., Poginova, N. V., Lopyrin, A. I., Judovič, S. S., & Diesperov, A. G. (1937). Pričiny jalovosti ovec i mery borjby a neï. [**Causes and Control of Sterility in Sheep**]. pp. 76. 84 figs., 7 tables. [Numerous refs.]

Moscow: All-Union Lenin Academy of Agricultural Sciences. [8vo]. [2s.] [English summaries].

About 6% of sheep in the U.S.S.R. are affected with sterility. The authors give the results of special investigations made on 100 ewes of improved local merino breed, 4-7 years old, which had been sterile for 2-3 years. Eight out of the 100 ewes reacted positively to various brucella tests (agglutination, complement-fixation, and allergic, and in one case *Br. melitensis* was isolated from the spleen.

P.M. examination revealed affections of the ovary in 16 ewes (atrophy in 3, cysts in 4, and oophoritis, adhesions and cicatrices in 9); there were affections of the uterus in 15 ewes (hydrometritis in 5, pyometritis in 2, and infantilism in 7, while in the case of one ewe the uterus was absent); there were affections of the fallopian tubes in 9 (hydrometritis in 1, cysts in 5, and cicatrices and occlusion of the tubes in 3); there were affections of the vagina in 25 (vaginitis in 3, abscesses in 1, cicatrization in 1, constriction in 2, tumours in 3, retention of a macerated foetus in 3, constriction in 10, and infantilism in 1, while in the case of one ewe the vagina was absent); and there were affections of the cervix in 78 (torsion and occlusion in 77, the other ewe having no cervix).

BINDEL, L. (1937). Rola owcy w patogenezie głowicy bydła. [**The Role of Sheep in the Spread of Bovine Malignant Catarrh in Poland**].—*Przegl. wet.* **52.** 536-541. 1 table. [Numerous refs.]

In continuation of his earlier article [*V. B.* **8.** 381.] B. reports on 44 outbreaks, 34 of which occurred on farms where cattle and sheep were habitually in direct contact. In the remaining cases an occasional transmission by contact with sheep and deer could not be excluded. Much of the paper is devoted to a review of the literature. B. emphasizes that contact with sheep appears to be an important factor in the incidence of the disease.—V. CHLÁDEK (PRAGUE).

I. MIESSNER, H. (1938). Virusabort der Stuten. [**"Virus Abortion" in Mares**].—*Dtsch. tierärztl. Wschr.* **46.** 744-745. [4 refs.]

II. HUPBAUER, A. (1938). Beitrag zum Virusabort der Stuten. [**"Virus Abortion" in Mares**].—*Ibid.* 745-748. 1 table.

III. OPPERMANN, T. (1938). Zur Frage des Virusabortes der Stuten. [**"Virus Abortion" in Mares**].—*Z. InfektKr. Haustiere.* **54.** 106-115. 1 table. [2 refs.]

I. A recapitulation of an earlier paper [*V. B.* **8.** 716]. [It is stated in the present paper that experiments on pregnant mares were carried out at the time of investigation and that the result supported the virus-causation theory, but these experiments were not reported in the earlier paper and the result of them is not described in either. See also SEDLMEIER, *V. B.* **9.** 172].

II. An account of bacteriological work on equine abortion in Yugoslavia. Between 1925 and 1937, 525 cases were investigated, of which 44% were negative bacteriologically. A sudden outbreak of abortion in a stud of 70 mares occurred two weeks after they had been vaccinated against *Salmonella abortus-equi* infection. Attempts were made to demonstrate a filtrable agent in 16 of the aborted foals, using Seitz E R filtrates, which were inoculated into a total of 24 guinea pigs and two rabbits, all pregnant; 13 guinea pigs and both rabbits aborted. Three pregnant mares were also inoculated with filtrates from aborted foals and g. pigs during their tenth, seventh and third months of gestation respectively. The first foaled at full term and the foal was killed. It is stated that some disease conditions were present, but no bacteria were isolated. Seitz filtrate from its liver and spleen caused abortion in one of three pregnant g. pigs. Nothing significant for virus

abortion was found in the other two mares. This evidence is offered to support the theory that there exists a type of abortion in mares which is caused by a living filtrable virus.

III. The author carried out an investigation at the stud, where MIESSNER and HARMS had observed an outbreak of abortion [*V. B.* **8.** 716.] and he continued to supervise the diet of the same mares during the next foaling year. He found that the mares had been very richly fed (natural pasture and supplementary corn, etc.) and that their blood was in a state of hyperglobulinaemia, the sublimate test being strongly positive. The serum phosphorus content and alkali reserve were also supernormal.

The diet was changed so as to reduce the protein intake and subsequently only one mare out of 20 aborted. O. therefore holds that the abortion reported first by MIESSNER and HARMS was really of dietetic origin. [The same argument might be applicable to the cases of SEDLMEIER (*V. B.* **9.** 172.) and HUPBAUER (in II, p. 568)].—J. E.

MIÈGEVILLE, J. (1938). Avortements par avitaminose. [**Abortion, associated with Avitaminosis in Mares**].—*Maroc méd.* **18.** 387-388.

In a large stud in Morocco the mares were aborting from five months until close on term; some foals were born alive, but died within 24 hours. Possible contagious causes were eliminated. The mares were in excellent health and well fed, the ration consisting of barley and dry forage; in this particular season it had not been possible to feed oats and sugar-beet in the autumn, owing to drought. After the injection of 6 c.c. of wheat germ oil and the feeding of green oats, no further abortions occurred. The cause of the abortions was therefore diagnosed as deficiency of vitamin E. An account is given of one mare in which the premonitory symptoms (colic) of abortion ceased after the injection of wheat germ oil; subsequently a dead and deformed foal was born, the deformity being possibly caused by lack of vitamin E in the earlier embryonal stages.—N. J. SCORGIE.

PARNES, J. (1939). Przyczynek do zagadnienia ślepoty miesięcznej koni. [**Periodic Ophthalmia in Horses**].—*Wojsk. Przegl. weteryn.* **10.** 33-37. [8 refs.] [French summary].

A clinical account of symptomatic treatment of equine periodic ophthalmia.

GRZYCKI, St., & GUCFA, W. (1937). Badania zmian chemicznych w mięśniach koni w czasie pracy i w myoglobinemii porażennej. [**Chemical Metabolism of Muscles of Working Horses with Reference to Myoglobinuria**].—*Przegl. wet.* **52.** 521-535. 7 tables. [15 refs.]

The authors tried to induce myoglobinuria artificially in horses, giving them very rich food (8 kg. oats, unrestricted amounts of hay, and 2 kg. sugar daily). After a prolonged rest the animals were given hard work in rainy or frosty weather. After work, there was a decrease of glycogen and an increase of lactic acid in the muscles. These findings were more pronounced after a short period of work than after a long period. The authors failed to induce myoglobinuria, and concluded that other causes also play a part in producing the disease.

TACKEN, P. H. W. (1938). Een geval van abnormale pigmentatie bij een vet kalf. [**Abnormal Pigmentation in a Calf**].—*Tijdschr. Diergeneesk.* **65.** 113-114. [English, French and German summaries].

Sharply outlined brown discolorations were found in the bones, lungs and liver of a fattened calf, and the skeletal muscles of the right side of the head also

had a dark brown colour. Osteohaemochromatosis was suspected. No symptoms had been noticed during life.—Jac. Jansen (Utrecht).

Pasqua, A. (1938). Ossificazione metaplastica del bacinetto renale in una vacca. [**Metaplastic Ossification in the Kidney of a Cow**].—*Clin. vet., Milano.* **61.** 532-538. 4 figs. on 2 plates. [19 refs.]

P. reviews previous literature on the subject of ossification, and states that he can only find reference to one such case. He describes in detail his own examination of a cow about eight years old in which the right kidney and ureter were found enormously enlarged and thickened. On section of the kidney, the medulla bounding the pelvis contained a plate of ossified connective tissue.—S. F. J. H.

Macchioni, I. (1936). Sulla degenerazione grassa a focolai nel fegato degli animali domestici (cosidetti " Infarti adiposi " nell'uomo). [**Fatty Degeneration of the Liver in Domestic Animals**].—*Clin. vet., Milano.* **59.** 411-421. 4 figs. [10 refs.]

M. examined a large number of livers of cattle from abattoirs for fatty degeneration, which seemed to occur in a large proportion of animals, some of which were otherwise perfectly healthy. A few cases in sheep and dogs are also mentioned. The lesions were localized on the top of the outer edge of the right hepatic lobe, invading the right lateral ligament which was increased in size. They consisted of small yellowish red spots which were never surrounded by inflammatory areas or by cicatricial tissue and which penetrated into the underlying tissue in wedges.

M. suggests that this condition is due to the mechanical movement of the ligament and the capsule over the adjacent parts of the liver provoking local circulatory disturbances which are aggravated by the pressure on the liver tissue, probably as a result of unusual exertion or unusual gastric or abdominal distension.

Cuille, J., & Chelle, P. L. (1938). La tremblante du mouton. Son étiologie. [**Aetiology of Scrapie**].—*Rev. Path. comp.* **38.** 1358-1372. [10 refs.]

The authors state that the majority of workers on scrapie consider that this disease is of an infectious nature, but that no aetiological agent has as yet been demonstrated [see *V. B.* **9.** 262].

The reasons for this belief are discussed, and the authors attribute the failure to reproduce the disease to two main causes, *viz* :– the use of unsuitable inoculation material, and the comparatively short duration of observation of the experimental animals as compared with the presumed long incubation period of the disease. In their own experiments extending over more than two years, they were able to produce the disease in healthy sheep from areas free of scrapie by inoculation of emulsions of the central nervous system from sheep in an advanced state of the disease. Inoculations were made into the brain, epidural space, anterior chamber of the eye, and subcutaneous conjunctival tissue, the most effective route being the intracranial. The incubation period was very variable, being never less than 11 months and in some cases almost two years. In two animals the disease was reproduced by the inoculation of filtered suspensions, indicating that the causal agent was a filtrable virus. The disease could not be transmitted under experimental conditions by cohabitation of affected and healthy sheep. Goats and rabbits were found to be resistant to inoculation, although in the latter nervous symptoms did arise after 45-75 days, which were attributed to trauma at the time of inoculation. After reviewing the evidence for the hereditary nature of the disease the authors conclude that there is nothing to support this view.

—N. J. Scorgie

Green, R. G., & Larson, C. L. (1938). **A Description of Shock Disease in the Snowshoe Hare.**—*Amer. J. Hyg.* **28.** 190-212. 6 figs. on 1 plate, 3 tables. [Numerous refs.]

The periodic decimation of snowshoe hares in Minnesota was investigated by the authors with regard to symptoms, blood chemistry, pathology and bacteriology, in 31 animals dead of " shock " disease. The responsible factor is suggested to be the shock of trapping, observed in both trapped and captive hares. Symptoms in both cases, in the opinion of the authors, are due to hypoglycaemic shock resulting from liver damage, and consequent failure of glycogen storage. Six figures illustrate the abnormal histology of the livers of affected hares. A discussion of possible causative factors indicates that some toxic agent associated with a parasite may be involved.—R. O. Muir.

Murciani, C. (1936). L'achondroplasie chez les animaux domestiques. [**Achondroplasia in Domestic Animals**].—*Thesis, Lyons.* pp. 58. 1 fig. [Numerous refs.]

This thesis is a general discussion on the subject of achondroplasia. It contains detailed P.M. findings in three cases of the disease in bovines, quoted from French work.

Various theories as to the aetiology of the condition are postulated. M. inclines to the theory that bacterial infection may be a possible cause. [The evidence for this seems to be very slight. The thesis contains little that is original]. —D. L. Hughes.

Lasserre, R., Lombard, C., & Labatut, R. (1938). Recherches sur le cancer des animaux domestiques. [**Cancer in Domestic Animals**].—*Rev. Méd. vét., Toulouse.* **90.** 425-451. [7 figs.]

The authors summarize the results of statistical analysis of the neoplasms encountered at the veterinary school at Toulouse during the years 1933-1937. The total number of animals examined comprised 10,139 carnivora and 1,574 horses, asses and mules.

The proportions of animals affected with neoplasms were :– dogs, 7%, cats, 1%, and solipeds, 1·6%. The corresponding figures for malignant tumours were 5·2%, 0·8% and 0·4% respectively. It will be observed that most neoplasms in carnivora were malignant. In the carnivora, the relative proportion of tumours in female and male animals was 4:1 in the dog and 16:1 in the cat. In the dog, the age at which neoplasms were most frequently observed was 6-10 years.

Details of the different types of tumours are given in the text in the form of tables and charts. Among the tumours in dogs and cats, it is very surprising to find that no neoplasms were recorded in any part of the alimentary tract, excluding the buccal cavity and anus. Several examples of multiple primary tumours are recorded.

In the dog, venereal sarcoma was extremely common, there being 20 cases affecting the penis and prepuce of the male and 83 involving the vulva and vagina of the bitch. Melanotic tumours were rare, one being found in a dog and one in a horse.—E. G. White.

Dieter, R. (1938). Ueber eine primäre Multiplizität von Zungengeschwülsten beim Schwein. [**Multiple Tongue Tumours in Swine**].—*Tierärztl. Rdsch.* **44.** 801-804. 1 fig.

Numerous nodules of various sizes, some as large as a pea, which were covered by intact squamous and often atrophic epithelium were found on the tongue,

epiglottis, tonsils and pharynx of an otherwise healthy pig carcass. Nodules were also present in the substance of the tongue and in the muscular tissues surrounding the pharynx. In all regions the nodules were infiltrated with occasional eosinophile leucocytes; lymphocytes were absent. The histological structure of some of the lesions was suggestive of a squamous epithelioma; others suggested a spindle cell sarcoma, and various intermediate grades were observed. The neoplasms in this pig are regarded as primary multiple sarcomata of varying degrees of differentiation. —E. G. WHITE.

DAVIS, D. J. (1938). **Goiter and Malignant Growth of the Thyroid in the Dog.** —*Arch. Path.* **26.** 339-347. 7 figs. [3 refs.]

Over a period of years, dogs with enlarged thyroid glands were selected from the large number of animals used for research purposes. In all, 26 cases were studied, most of the animals coming from the region of the Great Lakes, where goitre is common among the human population. The largest thyroid measured $12 \times 9 \times 4$ cm. and most of them were at least $7 \times 5 \times 2$ cm. In eight animals there were pulmonary metastases; secondary growths were not found in any other organs, with the exception in one case of a small nodule in the right auricle 1 cm. above the tricuspid valve. Although vascular dissemination to the lungs was common, in only one case were the regional lymph nodes of the primary site affected. The finding of aberrant thyroid tissue in the periaortic fat, previously recorded on numerous occasions, is mentioned. No references to veterinary literature dealing with benign or malignant hyperplasia of the thyroid are given. —E. G. WHITE.

I. FRITZSCHE, K. (1937). Versuche zur Erforschung und Bekämpfung der Marek'schen Hühnerlähme. — II. Versuche über die Brauchbärkeit des Präparates Therapeksi zur Bekämpfung der Hühnerlähme. III. Schutzimpfungsversuch mit einer Formolvakzine. [**Fowl Paralysis. II. Treatment. III. Vaccination Experiments with Formol Vaccine**].—*Z. InfektKr. Haustiere.* **52.** 124-127. [6 refs.] [See also *V. B.* **8.** 720].

II. FRITZSCHE, K. (1938). Beobachtungen über den Verlauf und die Bekämpfung der Marek'schen Hühnerlähme in überwachten Geflügelzuchten. [**The Control of Fowl Paralysis in Supervised Poultry Farms**].—*Berl. tierärztl. Wschr.* April 1st. 181-184. [6 refs.]

I. "Therapeksi" was found to be useless in the control of F.P. A formol-vaccine was used but it did not produce immunity. The author considers it unlikely that an effective curative or preventive agent will be found.

II. The author describes the course and control of F.P. on nine poultry farms. Hygienic and special breeding measures were adopted and the disease was controlled; this was considered to be evidence that the disease is of an infectious nature. Hens two years old or more were found to be no longer susceptible to the disease, and it was found that by breeding from birds 2-3 years old it was kept in control. The incidence of infection can also be considerably reduced by complete isolation during breeding, young birds being separated from the rest of the flock for about 15 weeks. Twelve-week-old pullets were found to be the most susceptible to infection.—SASSENHOFF (MUNICH).

JUNGHERR, E., & LANDAUER, W. (1938). **Studies on Fowl Paralysis. 3. A Condition Resembling Osteopetrosis (Marble Bone) in the Common Fowl.**—*Bull. Storrs agric. Exp. Sta.* No. 222. pp. 34. 31 figs. on 8 plates, 3 tables. [Numerous refs.] [See also *V. B.* **8.** 458].

An outbreak of osteopetrosis is described in a breeding flock of 2,000 birds

kept for purposes of genetic research. About 30 birds were affected in 1933, and 40 in 1934. Males and females appeared to be equally susceptible. The symptoms, gross pathology and histopathology are described in detail. The disease could be transmitted by inoculating chicks under a week old with heparinized whole blood or suspensions of bone-marrow from certain affected cases.

Practically all the natural cases of osteopetrosis had also lesions of lymphomatosis, and osteopetrosis could be set up by inoculating lymphocytic tumour material from them. The gross deformities seen in spontaneous cases of osteopetrosis were never reproduced experimentally. Lymphomatosis occurred in 47·5% of the inoculated chicks, compared with 2·5% in the controls. It was impossible to obtain a strain of osteopetrosis which did not also produce lymphomatosis, and the authors concluded that the transmissible agent embodies both osteogenetic and lymphogenetic properties. This agent, which was ultramicroscopic and cell-free, could withstand desiccation for 105 days.

A review of the literature on avian osteopathies is included.—J. E. Wilson.

NUTRITION IN RELATION TO DISEASE

Voegel, H. (1938). Acétonémie et hémoglobinémie puerpérale chez la vache. [**Puerperal Acetonaemia and Haemoglobinaemia in Cows**].—*Thesis, Alfort.* pp. 74. [Numerous refs.]

These two diseases are considered together because there are many similarities between them. They are both found in northern countries or in mountainous regions where the winters are long and severe, and occur in the winter in heavy milkers, 1-3 weeks after parturition. Both are accompanied by digestive disturbances; acetone always being produced in excess in the first, whilst in the second, haemoglobinuria is often accompanied by acetonuria. On P.M. examination, degenerative changes are found in the liver and kidneys, being most marked in the latter in the loops of Henle.

The acetonaemia is divided into a chronic type and a subacute type accompanied by nervous symptoms. The most important predisposing causes are a long winter, a deep milking breed and a concentrated diet. Although many theories are quoted, nothing is known regarding aetiology beyond the facts that ketone bodies are present in the blood in excess and that a pronounced hypoglycaemia occurs. Consequently the best treatment appears to be the administration of glucose and alkalis.

Haemoglobinaemia occurs in cattle five to eight years old, and has a sudden onset; the death rate is given as 70%. The aetiology of this condition is equally obscure; dry conditions favour its occurrence, poorly fed and well fed animals are equally susceptible. No satisfactory treatment is known.—A. T. P.

Patterson, J. B. E. (1938). **Some Observations on a Disease of Sheep on Dartmoor.**—*Emp. J. exp. Agric.* **6.** 262-267. 3 tables. [Numerous refs.]

A disease of Dartmoor sheep on upland pasture is described. The condition closely resembles "pine" in Scotland and "bush sickness" in New Zealand. In P.'s experiments, Welsh breeds were particularly susceptible, but Shetland sheep appeared to be immune. The disease is characterized by progressive emaciation and weakness, but rapid recovery follows transfer to lowland grazings.

The climatic, topographical, and soil conditions of the affected areas were investigated, and the amounts of available iron and cobalt were determined. It was found that, whereas healthy soils contained on the average 19·6 p.p.m. of

cobalt, unhealthy soils contained only 4 p.p.m. A preliminary trial with mineral supplements was carried out. Twelve lambs with characteristic symptoms of the disease were fed a daily ration of cake supplemented by 7 mg. cobalt chloride, 14 mg. manganese sulphate, and 1·365 g. zinc sulphate per head per week. Another 12 lambs were maintained as controls, receiving the cake, but not the minerals. The experimental group recovered first, and thereafter appeared more healthy, but at the end of two months both groups were of equal live weight.

Although the work had to be abandoned on account of the cost before a full trial was possible, it is considered likely that mineral supplements of cobalt, manganese, and zinc will be effective in controlling the disease.—D. D. Ogilvie.

McGowan, J. P. (1939). **Copper and Cobalt in Iron-Deficiency Anaemias. [Correspondence].**—*Brit. med. J.* Feb. 11th. 297.

The author discusses the view that too much attention has been given to the part played by Co and Cu in the physiology of haemoglobin formation. The curing of nutritional anaemias such as " bush sickness ", " pine ", etc., he still attributes solely to the administration of Fe, citing various recent references, and generally pours scorn upon the association of the " trace elements " with various plant and animal deficiency diseases.

[In view of the immense literature that has accumulated around this subject in recent years, much of which has been abstracted in this *Bulletin*, it is unnecessary to attempt a criticism of what is a minority view and a personal outlook. Although some of the literature quoted may appear to lend support to this view, reference to the original shows that McGowan is inferring more from the data contained therein than the authors either intended or themselves believed].—Alfred Eden.

Dols, M. J. L., Jansen, B. C. P., Sizoo, G. J., & van der Maas, G. J. (1938). **Distribution of Phosphorus in the Leg Bones of Chickens.**—*Nature, Lond.* **142.** 953-954. [2 refs.]

Following injection of a radio-active P salt into normal and rachitic chickens which were killed off after 22 hours for examination of the leg bones, it appears, from radio-active measurements and from radiographs, that P metabolism is more intense in the bone of rachitic chickens than in that of normal chickens. P metabolism is also more intensive in the epiphyseal than in the diaphyseal part of the same bone.—Alfred Eden.

I. Gallup, W. D., & Norris, L. C. (1939). **The Amount of Manganese Required to Prevent Perosis in the Chick.**—*Poult. Sci.* **18.** 76-82. 4 tables. [17 refs.]

II. Gallup, W. D., & Norris, L. C. (1939). **The Effect of a Deficiency of Manganese in the Diet of the Hen.**—*Ibid.* 83-88. 4 tables. [12 refs.]

I. Experiments on perosis, a nutritional disease involving deficiency of Mn, indicated that the amount of Mn required in the diet to prevent the disease in New Hampshire chicks is 50 p.p.m. Amounts of Mn up to 1,000 p.p.m. in food or drinking water were ineffective in preventing cases of perosis which developed early, indicating that the disease in its early stages appeared during the embryonic development of the chicks. Other results suggest breed and strain differences in susceptibility to perosis and in Mn requirements.

II. The Mn content of eggs was proportionately increased by feeding hens on known quantities of Mn (13-1,000 p.p.m.). Deficiency of Mn led to low egg production, high mortality of embryos, usually during the final stages of incubation, and slightly decreased fertility. Chicks hatched from eggs of low Mn content,

with low initial Mn reserves, showed no increase in susceptibility to perosis, and the prevention of this disease seems to be more dependent on the actual Mn intake in the food than the actual Mn reserves.—ALFRED EDEN.

SALGUES, R. (1938). La minéralisation de la plume au cours de l'ostéomalacie. [**Mineral Content of Feathers of Ducks with Osteomalacia**].—*C. R. Soc. Biol. Paris.* **129.** 751-753. 1 table. [1 ref.]

From analyses of the ash of feathers of normal and osteomalacic ducks for Ca, P, Mg, and CO_2 (carbonate) it was concluded that the principal Ca-P compound of feathers is not $Ca_3(PO_4)_2$ (as in bone) and that the composition of feather ash, moderately constant in normal birds, varies considerably during the course of the disease. Comparatively it would appear that the activity of the H_2PO_4' ion, in a biological medium, is greater than that of the PO_4' ion for normal birds, while the reverse holds true for osteomalacic subjects.—ALFRED EDEN.

I. GUILBERT, H. R., & HART, G. H. (1935). **Minimum Vitamin A Requirements with Particular Reference to Cattle.**—*J. Nutrit.* **10.** 409-427. 3 tables. [Numerous refs.]

II. GUILBERT, H. R., MILLER, R. F., & HUGHES, E. H. (1937). **The Minimum Vitamin A and Carotene Requirements of Cattle, Sheep and Swine.**—*Ibid.* **13.** 543-564. 4 tables. [18 refs.]

III. SEN, K. C., & SESHAN, P. A. (1938). **The Problem of Vitamin-A Deficiency in the Diet of Farm Animals.**—*Indian J. vet. Sci.* **8.** 169-182. [Numerous refs.]

IV. MCNUTT, S. H., & WALL, J. F. (1938). **Nutritional Blindness in Steers.**—*Vet. Med.* **33.** 497-499. 1 fig. [7 refs.]

V. MOORE, L. A. (1938). **Relationship between Carotene, Blindness Due to Constriction of the Optic Nerve, Papillary Oedema and Night Blindness in Calves.**—*J. Dairy Sci.* **21.** 114.

VI. STEWART, J., & MCCALLUM, Jennie W. (1938). **The Vitamin A Content of the Colostrum of Dairy Cows.**—*J. agric. Sci.* **28.** 428-436. 2 figs., 1 table. [5 refs.]

VII. IRVING, J. T., & RICHARDS, Marion B. (1938). **Early Lesions of Vitamin A Deficiency.**—*J. Physiol.* **94.** 307-321. 1 plate, 2 tables. [8 refs.]

I. The total storage of vitamin A and carotene in the liver and body fat of cows, 2-18 years old, which had had access to abundant green feed throughout life, was estimated to be about 0·6-0·7 g. in the younger animals and up to 3·6 g. in aged cows. The liver stored 67-93% in the form of vitamin A, while carotene predominated in the fat. The first detectable clinical symptom of vitamin A-deficiency was night blindness followed by nervous symptoms, convulsive seizures and total blindness. The daily minimum carotene requirement of the bovine was found to be 26-33γ per kg. live weight; 29γ per kg. daily prevented or cured clinical symptoms and promoted normal weight increases, but resulted in no storage. The hypothesis is advocated that vitamin A requirement is related to body weight rather than to energy requirement. For chickens and turkeys, the requirement was considerably higher than that of the mammals studied.

II. The minimum daily carotene and vitamin A requirements per kg. body weight were found to be 25-30γ for cattle and 6-8γ for sheep and swine. These figures agree with similar data on the rat. The night blindness test, supplemented by a check on storage, either by depletion or by the antimony trichloride

test on extracts of the liver tissue, was used as the criterion of sufficiency. The data are used to substantiate the hypothesis proposed in I. Observations on reproduction during the experimental period and data on depletion periods for swine and sheep are presented and discussed.

III. This paper consists of a general review of avitaminosis-A in so far as it relates to the practical feeding of farm animals. The carotene contents of various stock feeds and the requirements of vitamin A for the proper maintenance of the health of livestock are discussed. The provision of suitable green feeds and pasture lands as the only practical method of supplying the carotene requirement of farm animals is emphasized, also the importance of preserving the vitamin A potency of green plants when converted into hay or silage. The existence of avitaminosis-A in a mild form under the ordinary conditions of stock feeding in India and the need of rectifying this condition are also considered.

IV. Ninety steers fed a grain mixture of yellow corn 10 parts, oats and barley 3 parts, and a commercial protein concentrate 0·75 part, with oat straw as roughage, became affected with blindness after disturbances manifesting loss of appetite, a dry scabby nose and discharge from the nostrils, followed in some cases by diarrhoea. Apart from blindness or impaired sight no symptoms appeared between attacks, and in the six months during which this ration was fed, an average daily gain of nearly 2 lb. was recorded. P.M. examination of two blind animals showed that the lesions were confined to the optic nerve, in which microscopic examination revealed complete destruction of the fibres. It is submitted that this type of blindness is due to some nutritional factor.

V. A brief report is given of the relationship between vitamin A-deficiency and the occurrence of blindness, papillary oedema and night blindness in calves and cows. Mature cows on a vitamin A-deficient diet developed night blindness and papillary oedema, but blindness due to constriction of the optic nerve occurred only in calves, as in the latter the optic canal is not yet well calcified and is still growing in length. Further work with calves showed that the blindness was preceeded by papillary oedema and generally by night blindness.

VI. The vitamin A content of the colostrum of 100 stall-fed cows kept under the same conditions of dieting and management was found to range from 1,181 to 35 international units per 100 c.c. This wide range was not due to any differences in diet, breed, or date of calving, but it is suggested that the vitamin A content of the colostrum, which is assumed to depend directly on the liver reserves, may be materially affected by the length of the non-lactating period between successive calvings, since the longer the non-lactating period the less would be the depletion of the liver.

VII. Rats placed on a vitamin A-free diet at weaning developed degeneration of the funiculus praedorsalis at the level of the pyramidal decussation at an early age. When compared with the variability in pathological condition met with in other parts of the body, the uniformity of this degeneration found in the medulla suggests that this is one of the fundamental lesions of vitamin A-deficiency. No lesions were found in the medullas of animals which received the vitamin A-free diet with the daily addition of adequate amounts of carotene or vitamin A. In female rats, degeneration in the medulla became evident later than in males, while animals which were denied access to the mother's diet before weaning developed lesions earlier than those not so debarred. In many cases, well marked lesions were found in animals still increasing in weight and in apparently good health. The possibility of toxins in cereals causing the nerve lesions was eliminated, since the same lesions were found in animals on a vitamin A-free diet which contained no cereals.—R. Allcroft.

I. Galvão, P. E. (1938). Ueber die Wirkung des Vitaminkomplexes B auf den gesamten Stoffwechsel beim experimentellen Beriberi. [**The Action of Vitamin B Complex on Metabolism in Experimental Beriberi**].—*Pflüg. Arch. ges. Physiol.* **239.** 131-135. 2 tables. [2 refs.]

II. Abderhalden, E. (1938). Beitrag zum Problem der für die B_1- (Aneurin bzw. Thiamin-) Avitaminose charackteristischen Erscheinungen. [**Characteristic Symptoms of B_1- (Aneurin, Thiamin-) Avitaminosis**].—*Ibid.* **240.** 647-652. 2 tables. [5 refs.]

I. Pigeons with vitamin B-deficiency are affected with anorexia, which results in a slowing down in body metabolism and a fall in temperature; a rise in the metabolic rate and temperature can be brought about by the administration of vitamin B. The author suggests that the vitamin acts on the residue of food in the digestive canal, producing more energy and causing the rise noted above.

II. A. disagrees with Galvão [in I, above], and reports experiments by which he proved that the rise in temperature followed the administration of vitamin B even though the digestive tract was quite free of food. A. further reports that the convulsions of severe beriberi in pigeons occur much earlier in those fed on polished rice plus sugar than in those on polished rice alone.—J. E.

I. Abderhalden, E., & Abderhalden, R. (1938). Das Verhalten des Dünndarmes von an den Folgen der B_1-Avitaminosis leidenden Tauben gegenüber Acetylcholin. Einfluss von Vitamin B_1 (Aneurin, Thiamin) auf die Acetylcholinwirkung. [**Action of Acetylcholine on the Small Intestine of Pigeons with B_1-Avitaminosis. Influence of Vitamin B_1 (Aneurin, Thiamin) on the Action of Acetylcholine**].—*Pflüg. Arch. ges. Physiol.* **240.** 388-392. 5 tables. [3 refs.]

II. Abderhalden, E., & Abderhalden, R. (1938). Die Heilung der B_1 Avitaminose bei der Taube durch Zufuhr von Thiazol- und Pyramidinkomponente des Aneurins. [**Treatment of B_1-Avitaminosis in Pigeons by Thiazol and Pyramidin Components of Aneurin**].—*Ibid.* 746-752. [3 refs.]

I. The authors found that the small intestine of pigeons on a diet of polished rice (deficient in vitamin B_1) had lost the capacity for contraction on dosing with acetylcholine which always occurred in that of pigeons on a normal diet. A recovery of the acetylcholine tone was obtained by the administration of aneurin to the test pigeons. Aneurin itself has no stimulating action on the intestine.

II. It was found that beriberi in pigeons was curable equally well by aneurin or by two of its constituent parts (4-methyl-5-hydroxyethyl-thiazol and 2 methyl-4-amino-5-brommethyl-pyrimidinhydrobromide or 2-methyl-4-amino-5-oxymethylpyrimidin). These components acted rapidly when both were given simultaneously by the same route, but more slowly when given by different routes. —J. E.

Gregoire, C. (1938). La vitamine C et la maladie de Barlow chez le chien. [**Vitamin C and Scurvy in Dogs**].—*Ann. Méd. vét.* **83.** 366-371. 2 graphs.

Using the dichlorophenol-indophenol indicator test, G. estimated that the urine of healthy dogs contained 25-30 mg. of ascorbic acid per litre. It was possible to raise the level to 140-150 mg. by oral administration of ascorbic acid. A syndrome is described characterized by rachitism, and pain on handling or on pressure of the leg bones (due to sub-periosteal haemorrhage), and only 2-5 mg. ascorbic acid per litre of urine. Administration of lemon juice in most cases restored the urinary ascorbic acid to normal levels and resulted in amelioration of symptoms. A certain number of cases did not respond to this treatment, possibly owing to a dysfunction in body utilization of ascorbic acid.—N. J. Scorgie.

LE HÉNAFF, N. (1938). Comparison entre la valeur antiscorbutique du lait de vache frais et celle des laits pasteurisés. [**Comparative Value of Fresh and Pasteurized Milk against Scurvy**].—*Thesis, Alfort.* pp. 84. [Num. refs.]

The author carried out clinical and biological studies on the vitamin C content of various types of raw and pasteurized milk. He found the ascorbic acid content of commercial raw milk to be very low, owing to the oxidation processes which occur in the handling of the milk. When freshly drawn from the udder, milk was found to contain 1·65-1·93 mg. % of ascorbic acid, as against 0·72 mg. % for the commercial samples. After pasteurization at 80° or 90°C. the milk had mean values of 1·22 mg. % and 1·33 mg. % respectively, *i.e.*, values only slightly lower than those of the freshly drawn raw milk. Boiling at 120°C. for 25 minutes appeared to destroy the antiscorbutic factor completely.—N. J. SCORGIE.

KRAUSS, W. E., & BETHKE, R. M. (1936). **Anti-Rachitic Cow's Milk.**—*Proc. 25th-28th Conf. Amer. Ass. Med. Milk Comm. 1932-1935.* pp. 256-259. 2 tables.

Six Holstein cows were divided into two groups. All cows received the same winter ration, but one group received, in addition, sufficient irradiated yeast to give 55 Steenbock rat units per quart of milk. The milk from the other group was irradiated. Samples of milk and butter-fat from both groups were tested on rachitic rats, and appeared equal in curative properties. The prophylactic assay of the butter-fat, however, showed that the irradiated milk was more potent, 40 mg. of the irradiated fat being equal to 60 mg. of the butter-fat from milk from yeast-fed cows.—H. E. BYWATER.

—. (1936). **Report of Special Committee on Vitamin D Milks [Amer. Ass. Med. Milk Comm.]**—*Proc. 25th-28th Conf. Amer. Ass. Med. Milk Comm. 1932-1935.* pp. 251-256.

There are three types of antirachitic milk sold in U.S.A., *viz*, certified vitamin D milk, produced by feeding yeast to cows, and containing not less than 150 Steenbock units per quart, milk fortified with cod-liver oil concentrate and having not less than 150 Steenbock units per quart, and irradiated milk having not less than 55 Steenbock units per quart.

Clinical tests show that, unit for unit, milk fortified with cod-liver oil concentrate is apparently less effective in preventing rickets than vitamin D milk produced either by feeding yeast or by direct irradiation.

Suggestions were made for securing the recognition of certified vitamin D milk and for determining the antirachitic values of irradiated and "yeast-fed" milk.—H. E. BYWATER.

BARRIE, Mary M. O. (1938). **The Effect of Vitamin E Deficiency on the Rat. I. Duration of Gestation. II. Lactation. III. Fertility in the Female.**—*Biochem. J.* **32.** 1467-1473, 1474-1478 and 2134-2137. 2 figs., 9 tables. [Numerous refs.]

I. The length of gestation in the rat partially deficient in vitamin E was shown to bear an inverse relationship to the amount of vitamin E in the diet. Such partially deficient animals were unable to develop all the ova implanted, with the result that some of the foetuses were resorbed *in utero*. B. thinks that the prolongation of gestation caused by vitamin E-deficiency is due to the fact that the resorption of some of the foetuses delays the development of the others, and that this condition is an indirect effect, through the ovary, of anterior pituitary deficiency.

II. Although the total amount of milk secreted by the dams seemed adequate, the young of vitamin E-deficient rats developed paralysis and died unless given an adequate supplement of the vitamin. It is suggested that this paralysis is probably connected in some way with failure of the function of the anterior pituitary.

III. Discoloration of the uterus in vitamin E-deficient rats is described. Prolonged vitamin E-deficiency caused fibrosis of the uterine muscle, and a number of animals developed fibromyomata of the uterus. If the deficiency was allowed to proceed to advanced uterine degeneration, absolute sterility was produced.
—R. Allcroft.

PUBLIC HEALTH

Locke, R. C. (1937). **Rapid Detection of B. tuberculosis in Milk.**—*Vet. Rec.* **49.** 824-828. 3 tables. [1 ref.]

L. enlarges on the clinical aspect of the cases in a series reported by Maitland [*V. B.* **7.** 633]. He confirms the value of the method employed by her in examining milk for TB.—H. E. Bywater.

Medlock, F. W. (1937). **Clinical Examination of Dairy Herds.**—*Vet. Rec.* **49.** 881-888.

M. is convinced that swabbing an animal's throat by mechanical means for the collection of material for examination for the presence of tubercle bacilli is an inferior method, and suggests that the best way is to collect sputum on a flat surface after making the cow cough. He states that a very large number of uterine swabs from suspected cows reveal the presence of tuberculosis. Clinical examinations of dairy herds cannot be regarded as a method of eradicating TB., but are a means of disseminating knowledge amongst stock owners.

Prior to periodical clinical examinations in Essex, the incidence of TB. in bulk milk was 12%, but after one year (three examinations *per annum*) this figure dropped to 4%. M. emphasizes the great importance, as a check on the clinical examination, of biological examination of a representative herd sample of milk, taken immediately after clinical examination, but excluding milk from any animal under suspicion. Samples from suspected animals are tested individually.
—H. E. Bywater.

Thomas, J. J. (1936). **Report of the Committee on Methods and Standards.**—*Proc. 25th-29th Conf. Amer. Ass. Med. Milk Comm. 1932-1935.* pp. 271-276.

The Producers' Committee submitted to the conference recommendations for the revision of methods and standards for milk production. It was agreed that cattle producing certified milk should be tested for brucellosis, and that reactors should be removed immediately from such herds. Herds having reactors should be retested at intervals of not more than 30 days. All cows admitted to herds should also be retested within the same period.

It was also agreed that employees should be medically examined once a year and that, in the event of communicable disease occurring on the farm, the affected persons should be removed from the farm or be efficiently isolated.

It was suggested, but not agreed, that the bacterial count for certified milk should be reduced from 10,000 to 5,000 per c.c. It was alleged that methods used in examinations for bacterial counts lacked uniformity.—H. E. Bywater.

FERGUSON, R. R. (1936). **Prevention of Pathologic Infections on Certified Farms.** —*Proc. 25th-28th Conf. Amer. Ass. Med. Milk Comm. 1932-1935.* pp. 327-339.

As a result of work instigated some years ago by the Chicago Medical Society Milk Commission, it is now possible, by classification of streptococci according to the classical methods, to trace the cow or human being responsible for infecting the milk supply.

Employees on certified farms supplying milk to Chicago are now tested for susceptibility to diphtheria and scarlet fever (by the Schick and Dick tests), and positive reactors are given protective inoculations.—H. E. BYWATER.

RIEDEL. (1938). Lebensmittelüberwachung in den Heeren der Kulturstaaten. [**Food Inspection in the Armies of Different Countries**].—*Z. Veterinärk.* **50.** 289-325. [Numerous refs.]

The article in a general review of what information R. has been able to obtain from the literature. As in the case of certain countries at least, the procedure followed has not been published, much of the review is incomplete. He describes in considerable detail what he has found to be the practice in many countries, and gives a good account of the system in Germany.—M. F. BENJAMIN.

I. ZEINERT. (1938). Bericht des bakteriologischen und biologischen Laboratoriums des Städt. Schlachthofes Königsberg (Pr.), für das Jahr 1936. [**Report of the Bacteriological and Biological Laboratory of the Königsberg Abattoir**].—*Z. Fleisch- u. Milchhyg.* **48.** 252-254. 5 tables.

II. HENNEBERG, O. H. (1938). Fleischbeschau und Lebensmittelkontrolle in Oesterreich nach der Wiedervereinigung mit dem Reiche. [**Meat Inspection and Food Control in Austria after Union with the German Reich**].—*Ibid.* 341-343.

I. During 1936, 649 samples of meat were submitted to bacteriological inspection. In 18 cases, organisms of the paratyphoid group were isolated, (*Salmonella enteritidis* in 14, *S. typhi-murium* in one, *S. paratyphi* B in two, and an unidentified strain in one), from cases of emergency slaughter (colic in horses, peritonitis, pneumonia and mastitis in cattle, and liver necrosis and icterus in calves). 130 milk samples were examined and 14·6% were found to contain more than 400,000 organisms per c.c.

II. H. states that, previous to the union with the German Reich, food control in Austria was not as efficient as that practised in Germany. All the German regulations relating to food inspection have now been enforced in Austria, and he welcomes the institution of State veterinary laboratories attached to the abattoirs.—M. F. BENJAMIN.

I. KLIMMECK. (1937). Eine grosse bakterielle Lebensmittelvergiftung und ihre Lehren. [**An Extensive Outbreak of Meat Poisoning**].—*Berl. tierärztl. Wschr.* July 23rd. 465-469, and 478-481.

II. KATHE. (1937). Lebensmittelinfektionen durch besondere Erreger. [**The Causes of Food Poisoning**].—*Zlb. Bakt. I.* (*Orig.*). **140**. 71*-74*.

I. This is a report on an epidemic of meat poisoning in Silesia in 1936, in consequence of which 382 people fell ill and three died. The cause was horse meat consumed minced or as sausage meat, and investigation revealed that two horses had been slaughtered, one of which was the source of infection. One was a foal, which had suffered from a fracture of the head of the femur over a long period and latterly from enteritis. The foal meat was passed as fit for consumption

since no pathological changes could be discovered, but persons eating it were poisoned. Infection of the foal's carcass was traced to its having been hung in close contact with the other (infected) carcass in the same refrigerator, instead of being separated until the examination was completed. The infecting organism was *Salmonella typhi-murium*.

II. K. states that certain saprophytes, notably *Proteus vulgaris*, *Bacterium coli* and *Bacillus subtilis*, can cause food poisoning when food has been stored in unclean surroundings or manufactured without necessary care. Milk products, especially cheese, have also caused poisoning when contaminated by certain types of *Bact. coli*; K. describes three such epidemics due to a haemolytic *Bact. coli*, in which the blood of affected persons contained agglutinins for this organism. The organism was lethal in 4-8 days to mice fed on the contaminated cheese.
—M. F. Benjamin.

Stock, P. G. (1938). **The Utilization of Lethal Gases in Hygiene.**—*Proc. R. Soc. Med.* **31.** 427-442. 5 figs. [Numerous refs.]

An account is given of the uses of lethal gases in the practice of hygiene. Amongst the uses mentioned are the destruction of pathogenic organisms, rodents, insects which spread disease, insect pests (including agricultural pests) and those associated with stored foodstuffs, and also the disinfection of water or partial disinfection of sewage effluents.

Details are given of the methods of application of hydrogen cyanide, the oxides of sulphur, heavy naphtha, and of a mixture of cyanogen chloride and hydrogen cyanide. S. points out that not only does the " vacuum method " of fumigation secure better and quicker penetration, but that also the de-oxidation which occurs lowers the resistance of insects. Sulphur dioxide is stated to be a good insecticide but to have little effect on the eggs.

Other substances mentioned are chloropicrin (which destroys the eggs and larvae of most insects), ethylene chloride, ethylene oxide, carbon tetrachloride, tetrachlorethane, and the newer forms of thiocyanates. S. considers it too early to say whether or not it is possible to uphold the claims that the last-named are not lethal to human beings.—H. V. Hughes.

THERAPEUTICS

Hornby, H. E. (1938). **Further Notes on Treatment of Trypanosomiasis with Particular Reference to Use of Surfen C.**—*Rep. Dep. vet. Sci. Tanganyika, 1937.* pp. 27-33. 1 table. [See also *V. B.* **5.** 478].

The relative values of tartar emetic and three Bayer products, *viz*, Surfen C, Surfen C(T) and antimosan, as trypanocidal agents are discussed on the result of the treatment of some fifty bovine cases of trypanosomiasis. H. concludes that :– " the effect on the body of Surfen C given intravenously is too severe to warrant its use by laymen, though it may be justifiably used by veterinarians. On the other hand Surfen C given intramuscularly is safe, and probably as effective as when given intravenously. The expectation of cure after a single injection of Surfen C is higher than after a course of five injections of tartar emetic or antimosan ".
—S. A. Evans.

Meyer, J. R. (1938). Tratamento des sarnas dos animais pelo timbó. [**The Treatment of Mange in Animals by Means of Timbo**].—*Biologico.* **4.** 257-261. 2 figs. [Copied *verbatim* from *Rev. appl. Ent.* **27.** 41].

In experiments in Brazil, the author found that extracts of timbo [*Loncho-*

carpus], which contain rotenone, are effective against mites causing mange in various animals. Small animals are best treated by an ointment made by mixing the ether extract with lard or vaseline, and larger ones by a liquid consisting of an extract in alcohol. In both cases, frequent applications are required, and if the liquid fails to give control, supplementary treatment with the ointment is necessary.

PETROV, A. M. (1937). Dostiženija v borjbe s geljmintozami pušnyh zverei. **[Helminthological Work with Fur Animals: Crenosoma Infestation]**.—*Sovyet. Vet.* Nos. 11-12. pp. 31-36.

An account of experiments on 328 crenosoma-infested foxes, divided into six groups. Five groups were given two intratracheal injections at intervals of 2-3 days with a watery solution of iodine (1:1,500), in doses of 1, 2, 3, 4 and 5 c.c. respectively, the animals lying on their backs; the sixth group remained untreated. All the animals were killed and examined 2-10 days after treatment. In the untreated group there was an average infestation of 61 crenosoma, and this number was taken as an average of initial infestation in all the animals, the effectiveness of the treatment being calculated on this basis. The best results were obtained in the third group, injected with 3 c.c.; 23 out of the 56 animals were completely free of infestation, and the average effectiveness of the treatment was 80%. However, as five animals from the fourth and fifth groups died from the effects of the treatment, the authors suggest that 1-2 c.c. is a safer dose (effectiveness 72% and 76% respectively).

MERZDORF, G. (1937). Versuche mit Prolan in Oel bei Sterilität und Nymphomanie. **[Treatment of Sterility and Nymphomania with Prolan in Oil]**.—*Inaug. Diss., Hanover.* pp. 58. [Numerous refs.]

In trials on a few cows with ovarian insufficiency, persistent corpus luteum and ovarian cysts respectively, it was found that oily suspensions of prolan (anterior pituitary hormone) were more active than watery suspensions.—A. W. M.

PHYSIOLOGY

REIHART, O. F. (1939). **Chemical Studies of the Blood of Normal Cows.**—*J. Amer. vet. med. Ass.* **94.** 33-34. 2 tables. [10 refs.]

Blood from 60 lactating and 20 non-lactating cows and heifers was analysed for sugar, non-protein N, urea N, preformed creatinine, uric acid, cholesterol and chloride, and the serum for Ca, Mg, inorganic P, Na and K. Although full details are not given, the average figure and standard deviation of the mean for each constituent are shown. Generally the variations are within normal limits, but samples taken two hours before and after milking and at milking time showed that serum Na was lower in lactating cows but was generally increased during milking. Milking also caused the blood cholesterol content to rise and the chloride to fall, this tendency manifesting itself at the time of milking and continuing for two hours after.—ALFRED EDEN.

SABOVLJEV, A. (1938). Prilog izučavanju frakcija kalcijuma, kalijuma i fosfora u krvnom serumu domačih zivotinja. **[The Blood Serum Ca, K, and P in Domestic Animals]**.—*Vet. Arhiv.* **8.** 573-591. 11 tables. [Numerous refs.] [German summary].

The Ca, K, and P contents of the blood serum were estimated by means of the ultrafiltration and absorption method, titration of Ca and K being according

to the method of KRAMER and TISDALL, and of P according to that of BENEDICT. Both diffusible and non-diffusible Ca and K are met with in the blood serum, while P occurs only in a diffusible state. The following values for blood serum Ca were recorded in healthy animals :– in fowls, 13·65 mg. % ; in horses, 11·87 mg. % ; in cattle, 9·94 mg. % ; and in cats, 9·6 mg. %, but the values found for the ionized Ca with the methods used are unreliable and were inconstant. P. was found as follows :– in fowls, 5·46 mg. % ; in horses, 6·64 mg. % ; in cats, 7·09 mg. % ; in dogs, 8·6 mg. % ; in cattle, 9·66 mg. % ; in pigs, 10·65 mg. %, and in lambs, 11·94 mg. %. K content was found to be :– in cattle, 23·75 mg. %, in cats, 31·37 mg. %, and in fowls, 31·06 mg. %. [The figures determined for P in serum will not be reliable].—B. OSWALD (KRIŽEVCI).

FEDOTOV, A. I. (1937). Cerebrospinaljnaja zidkostj pošadi. **[The Cerebrospinal Fluid of the Horse]**.—*Sborn. Rab. Leningrad. vet. Inst. 1937*. pp. 263-273. 4 figs. [18 refs.] [German summary].

Cerebrospinal fluid was obtained from 128 horses, by one or more of three different methods :– (1) sub-occipital puncture, (2) cervical puncture between the atlas and axis, and (3) lumbar puncture. F. suggests that the second method is much easier and safer than the first.

The cerebrospinal pressure was measured by a simple vertical glass tube connected with the tapping needle. The pressure varied between 180 and 223 mm. in a tube of 3 mm. diameter.

Cisternal puncture by methods (1) and (2) on five horses showed that 170-300 c.c. of fluid could be obtained at a time, the fluid being almost entirely replaced after 24 hours. This procedure, however, caused ataxia lasting 2-3 days. One 20-year-old mare gave 175 c.c. of fluid on each of six punctures over a period of 19 days.

The normal C.S.F., as seen in 27 horses, was a colourless, odourless and transparent liquid with a salty taste, consisting of 99% water, 0·44% organic substances and 0·56% ash. Its specific weight was 1·006-1·007, its surface tension 1·042-1·047, and its pH 7·4-7·6. The chemical composition of the fluid included also 0·297-0·366 mg. % of protein, 54·58 mg. % of sugar, 720-780 mg. % of sodium chloride, 4·1-5·2 mg. % of calcium and 2·3-3·1 mg. % of urea. There were 2·5 cells per c.c.

THALHIMER, W., SOLANDT, D. Y., & BEST, C. H. (1938). **Experimental Exchange Transfusion Using Purified Heparin.**—*Lancet*. **235.** 554-557. 5 figs., 1 table. [5 refs.]

Exchange transfusions, by the use of a specially designed pump and purified heparin to prevent thrombosis, were carried out between two anaesthetized dogs. Urea accumulating in the blood of one dog subjected to bilateral nephrectomy was rapidly excreted in the donor's urine, the blood urea level falling to normal within 12-18 hours. No injurious effects were noticed in the tissues of the donor dogs following the transfusion, after they had been allowed to recover.—ALFRED EDEN.

GAUS, O. (1938). Ueber Hämosiderose der Leber und Milz beim Haushuhn. **[Haemosiderosis of the Liver and Spleen in Domestic Fowls]**.—*Dtsch. tierärztl. Wschr.* **46.** 805-806. [Numerous refs.]

Examining normal fowls, G. found that their livers contained considerable amounts of haemosiderin. He concludes that this is a natural occurrence in fowls and explains it on the grounds that the liver of these birds is the only organ

adequately adapted for the breakdown of old erythrocytes ; consequently haemosiderin is concentrated in the liver, instead of being spread throughout various parts of the body as in the case of mammals.—E. J. PULLINGER.

I. BERLINER, V., & WARBRITTON, Virgene. (1937). **The Pituitary and Thyroid in Relation to Sperm Production in Rams.**—*Proc. Amer. Soc. Anim. Prod. 1937.* pp. 137-142. 1 table. [11 refs.]

II. COMSTOCK, R. E., & BRADY, D. E. (1937). **A Study of Characteristics of Normal and Abnormal Semen of the Sheep.**—*Proc. Amer. Soc. Anim. Prod. 1937.* pp. 233-238. 2 tables. [5 refs.]

I. The mechanism of thyroid activity on sperm production is still not clear, but the fact of chief importance to breeders is that when high temperatures prevail before and during the onset of the breeding season, rams with a high range of thyroid activity are better able to reproduce. Thyroid specimens were obtained by biopsy and examined. Low thyroid activity can be corrected in a relatively normal animal by thyroxin therapy. The authors state that rams which do not readily respond to this treatment should not be used for breeding.

II. Data were collected on length of sperm head, co-efficient of variability of sperm head lengths, ability to live under conditions in which semen is preserved for artificial insemination, number of spermatozoa per c.c., and pH of semen. The pH of sheep semen containing normal numbers of sperm is 6·9 or less. In the semen of rams fed a short ration (insufficient calories) of high quality the number of sperm per c.c. was high, but the quantity of ejaculate was low. Motility of sperm after storage is a partial indication of quality.—J. A. GRIFFITHS.

DE NITO, G. (1936). Ueber eine neue Schnellmethode zur Frühdiagnose der Schwangerschaft. [**A New Rapid Method for Early Diagnosis of Pregnancy**]. —*Münch. med. Wschr.* **83.** 1272-1273. [8 refs.]

The author's method is to inject 5-10 c.c. filtered urine into the ear vein of a rabbit. A leucocyte count is made before, and 2-4 minutes after the injection, a decrease in leucocytes signifying pregnancy. This method gave 90% positive results when employed on the urine of about 100 women at various stages of pregnancy.—J. E.

STIEGLECKER, G. (1938). Ueber die Verwendbarkeit der Schnellmethode nach Nito zur Bestimmung der Gravidität beim Rind. [**de Nito's Method of Pregnancy Diagnosis Applied to Cattle**].—*Wien. tierärztl. Mschr.* **25.** 483.

The urine of 20 pregnant cows was tested by this method, but as only one gave a positive reaction this method was shown to be useless as a means of diagnosing pregnancy in cattle.—A. T. PHILLIPSON.

RUNGE, S. (1937). Rozpoznanie ciąży u klaczy zą pomocą badania moczu metodą E Cuboni'ego. [**Diagnosis of Pregnancy in Mares by Cuboni's Method**]. —*Rozprawy biol.* **15.** 62-76. 1 table. [14 refs.] [German summary].

R. considers Cuboni's method far superior in practical value to the Aschheim-Zondek method, The former is far less expensive, it can be carried out by any veterinary surgeon, does not require complicated apparatus, and takes a short time. The urine used for the method need not be fresh, it can be taken without a catheter, and a small quantity (5-15 c.c.) is sufficient. Pregnancy may be diagnosed from the 108th day.

R. examined 140 mares by the above method. The results were positive in 60 cases (42·8%), diagnosis being correct in 59 cases (98·3%), negative in 76

(54·2%), diagnosis being correct in 75 (99·2%) and doubtful in 4 (2·8%). He considers the two mistakes to have been due to urine being carelessly labelled, as this was done by various stable hands.

MORTON, R. A. (1938). **On Recent Vitamin Studies.**—*Vet. Rec.* **50.** 1169-1175. 1 table.

A general account of the properties of the different vitamins. There is no new material.—W. J. IRONSIDE.

I. DAVIS, H. J., NORRIS, L. C., & HEUSER, G. F. (1938). **The Rôle of Vitamin G [B_2] in Reproduction in Poultry.**—*Poult. Sci.* **17.** 81-86. 1 fig., 5 tables. [8 refs.]

II. DAVIS, H. J., NORRIS, L. C., & HEUSER, G. F. (1938). **Further Evidence on the Amount of Vitamin G [B_2] Required for Reproduction in Poultry.**—*Ibid.* 87-93. 5 tables. [9 refs.]

I. The addition of dried whey as the source of vitamin B_2 [vitamin G in the American nomenclature] to an otherwise adequate basal ration fed to laying pullets markedly increased the percentage hatch of the fertile eggs, but did not increase the fertility of the eggs, nor influence egg production, egg size, feed consumption, or the physical condition of the hens. The addition of a suitable amount of purified lacto-albumin to the basal diet showed that the beneficial effect of the dried whey was due to its vitamin G content rather than to its protein content. The embryos of the hens fed on the vitamin B_2-deficient diet grew more slowly and showed a higher mortality than the embryos of hens receiving an adequate amount of the vitamin, as also did the chicks of the vitamin B_2-deficient hens, even when fed a diet containing sufficient vitamin B_2.

II. Experiments are described showing the rapid rate of depletion of the vitamin B_2 reserves of the hen on a vitamin B_2-deficient diet which resulted in a decline of the hatchability of the eggs. Addition of riboflavine to the vitamin B_2-deficient basal diet rapidly restored the hens' reserves, and the maximum hatchability of the eggs was obtained during the second week after the addition of 900 g. of riboflavin per hen per week. Approximately 245 Cornell units of vitamin B_2 per 100 g. of diet maintained a normal hatchability of eggs. Mortality was considerably higher in chicks hatched from the eggs of hens fed a vitamin B_2-deficient diet.—R. ALLCROFT.

TECHNIQUE AND APPARATUS

MORTON, H. E., & PULASKI, E. J. (1938). **The Preservation of Bacterial Cultures. 1.**—*J. Bact.* **35.** 163-183. 1 fig., 2 tables. [Numerous refs.]

The authors tested three methods of preserving bacterial cultures :– (a) sealing the end of the tube containing actively growing organisms in beef infusion broth, (b) the covering with sterile heavy paraffin or mineral oil of cultures on appropriate solid media, and (c) a rapid desiccation method very similar to that of SWIFT (1921). Numerous aerobic types and a few micro-aerophilic types, but no anaerobic types, were used for these three experimental studies. Optimum temperature for storage varied according to the bacteria used.

The criticism of method (a) was that several species of bacteria did not survive for more than a few months, and others underwent dissociation by changes in colony type and pigment formation. Otherwise, about 20 bacterial species showed no changes after 45 months' storage.

Failure to survive for more than a few months was also recorded for certain

species of bacteria when method (c) was used. The general criticism of the method was the complicated apparatus and technique required, and the excessive work necessary; faults in technique are a potential danger, with consequent failure to preserve a strain.

The authors stress the many points in favour of method (b). Chief of these were reduction in contamination of cultures, especially by moulds, and failure to cause dissociation colony types. The authors consider it to be the method of choice for unstable species of bacteria. Storage survival periods of 44 strains of various bacterial species are tabulated for refrigerator, room and incubator temperatures. The authors point out the necessity for using a non-rancid, atoxic oil, and detail the technique of sub-culturing which they employed.—C. V. Watkins.

Corpor, H. J. (1938). **A Simple Procedure for the Diagnostic Culture of Tubercle Bacilli.**—*J. Lab. clin. Med.* **23.** 1195-1202. 2 figs., 1 table. [11 refs.]

A convenient method is described for the isolation of small numbers of tubercle bacilli from sputum, urine, etc. The material is treated with an equal volume of 5% oxalic acid at room temperature for 2-5 hours. The action of the acid is then inhibited with a sterile neutral buffer solution, and the sediment is planted on to a crystal violet potato cylinder in an aqueous solution of glycerin, or on to inspissated glycerin egg-yolk medium. C. employed screw-capped glass vials (35 c.c. capacity) throughout the operation, a pad of cork being inserted in the cap to ensure the maintenance of an adequate air supply to the culture. Good results were obtained by two independent workers both employing this technique.—E. C. Hulse.

Salomon, W. (1937). Zur Farbung von Bakteriengeisseln. [**The Staining of Bacterial Flagella**].—*Z. InfektKr. Haustiere.* **51.** 303-312. [Num. refs.]

Methods of staining flagella are discussed. S. considers that Casare Gil's method is very satisfactory, but he also recommends the use of a simpler method which he has developed. This involves staining with a 3-5% solution of victoria blue, after mordanting with a mixture of alum, corrosive sublimate and tannin. Details are given regarding the correct way of preparing smears for flagellar staining.—E. J. Pullinger.

Scherp, H. W., & Hughes, T. P. (1939). **A Simple and Inexpensive Apparatus for the Desiccation of Biological Materials from the Frozen State.**—*J. Immunol.* **36.** 29-36. 1 fig. [5 refs.] [See also *V. B.* **9.** 348].

The apparatus described can dry up to 40 c.c. serum distributed in 4-8 containers attached by means of a manifold to a tube filled with " drierite " (a specially prepared anhydrous calcium sulphate) which is connected to a Hyvac pump and to a McLeod pressure gauge. The frozen samples are attached to the manifold and kept frozen until a pressure of 0·05 mm. is reached. After 18-24 hours' drying, the containers are sealed off.—R. Allcroft.

Koch, J. (1938). Ueber die Technik der Bluttransfusion beim Pferde unter Berücksichtigung der Verträglichkeit des Spenderblutes. [**Technique of Blood Transfusion in Horses with Regard to Tolerance to Transfused Blood**]. —*Arch. wiss. prakt. Tierheilk.* **73.** 266-284. 2 figs., 4 tables. [Num. refs.]

A technique was worked out by which 4·2 litres of blood can be transfused from one horse to another in 15 minutes. The apparatus employed is a simple commercial one; it is described in detail.

Six blood groups have been described in horses, but the process of determining

the group of any particular horse is slow. A simple method, which takes 15 minutes to perform, has been used to see whether the blood of the donor is suitable for the recipient. Samples are taken from both, and the corpuscles of the donor are put up against the plasma or serum of the recipient. This test is essential as the transfusion of unsuitable blood leads to severe clinical symptoms, including acceleration of the pulse and respirations, a rise in blood pressure, perspiration, muscle tremors and general weakness ; death may occur. With a suitable blood transfusion the blood pressure of the recipient may usually be expected to rise 3-6 hours later and the temperature to rise to normal after about six hours.—A. T. P.

McNaught, K. J. (1939). **The Determination of Cobalt in Animal Tissues.**—*Analyst.* **64.** 23-27. 2 tables. [15 refs.]

The nitroso-R methods for the estimation of Co in animal tissues has been further modified, with a claimed sensitivity down to 0·05 γ. In brief, the method consists of wet digestion of the tissue with HNO_3 and H_2SO_4, fuming off the H_2SO_4, and extraction with HCl. Fe is removed by extraction with ether and Cu by H_2S. The Co-nitroso-R colour is then developed at the neutral point and buffered by sodium acetate, with various improvements on previous procedures. The excess reagent is destroyed by HNO_3, and the final volume brought to 10 ml., after which the colour is matched in tubes of narrow bore against standard amounts of Co similarly prepared. Excellent recoveries of added Co were obtained and Co determination made upon 2 g. wet weight of rat livers showed on seven animals an average content of 0·2 p.p.m., expressed on a dry matter basis.—Alfred Eden.

Anon. (1939). **The Cyclotron. Its Application in Medicine.**—*Brit. med. J.* Jan. 14th. 81.

A brief account is given of a lecture delivered by Dr J. D. Cockcroft on the construction and application of the cyclotron. This apparatus is extremely complicated and costly and has not yet emerged from the experimental stage, but its promise is evidenced by the fact that energies exceeding six or eight million volts have been obtained. The main applications of the cyclotron at present are three :- (1) as a powerful generator of neutrons for use in physical and biological experiment ; (2) as a machine for producing in large quantity the radio-active forms of the common elements, and (3) as a means of producing extremely energetically charged particles, *viz*, protons, deuterons and alpha-particles, and permitting the study of their interaction with matter. Experiments indicated that neutrons may have a differential effect on normal and malignant tissue, and that such difference may be favourable to their use in the treatment of malignant disease.
—R. Allcroft.

Rexroth, E. (1937). Ueber die Brauchbarkeit der Takata-Reaktion in der Hundepraxis. [**Value of the Takata Reaction in Dog Practice**].—*Inaug. Diss., Berlin.* pp. 29. 6 tables. [Numerous refs.]

The Takata reaction is a colour test which is elicited when certain pathologically altered fluids are added to a mixture of $HgCl_2$ and Na_2CO_3 in the presence of fuchsin ; the development of a violet colour indicates a positive reaction. This colour change is thought to depend on the presence of excess protein, or to an abnormal proportion of proteins in the fluid (serum, cerebrospinal fluid, ascites fluid, etc.).

R. applied the test to some canine diseases (nephritis, tuberculosis, Stuttgart disease, distemper, etc.), but obtained no results of any significance. The test is therefore considered non-specific and useless for differential diagnosis.—J. E.

MISCELLANEOUS

I. Wilson, J. E. (1938). **Poultry Husbandry and Its Influence on the Incidence and Spread of Disease.**—*Vet. Rec.* **50.** 1493-1496. Discussion 1496-1499. [2 refs.]

II. Anon. (1938). **The Veterinary Profession and the Poultry Industry.**—*Ibid.* 1499-1501.

I. The writer discusses the systems of management of adult fowls in Great Britain, *viz*, (1) the extensive system, (2) the semi-intensive system, (3) the intensive system, and (4) the battery system. The advantages and disadvantages of each system are dealt with and it is stated that the chief factors in controlling and preventing disease are :– suitable diet, vigorous culling, avoidance of over-crowding, strict hygienic methods, and prophylactic measures where indicated. W. favours the intensive system from the point of view of control of disease, but considers that taking all factors into consideration the extensive system should be employed if possible, poultry being included in the rotation of farming. The latter point was amplified by Dobson during the discussion and the importance of isolation of fresh stock was emphasized. The influence of environment on disease was mentioned by Taylor ; this factor operates not only in the case of parasitic diseases but also in the case of those caused by bacteria and viruses.

II. An editorial article concerning the report of the Poultry Technical Committee, established by the Minister of Agriculture, England and Wales, and the Secretary of State for Scotland [*V. B.* **8.** 395].—J. C. Wallace.

Cockayne, A. H. (1939). **Investigation of Animal Diseases. Formation of a New Division.**—*N.Z. J. Agric.* **58.** 193-196. 3 photographs.

In order to co-ordinate all research activities within the Department of Agriculture a new Division of Animal Research has been created. Dr J. F. Filmer has been appointed Director. The Division incorporates the Veterinary Laboratory, Wallaceville, the Ruakura Farm of Instruction, and the Chemical Section. —L. W. N. Fitch.

Pollock, R. C. (1939). **How the Work of the National Live Stock and Meat Board Relates to Veterinarians.**—*J. Amer. vet. med. Ass.* **94.** 198-201.

An account is given of the activities of the National Live Stock and Meat Board, whose objects are to initiate and encourage education and research in regard to livestock and meat products, to disseminate accurate information about meat in the diet and its relation to health, and to promote the interests of the livestock and meat industry.

The Board conducts research into various aspects of meat production and consumption. An educational programme on the dissemination of information to housewives on meat cooking, and retailers on the merchandizing of meat has been carried out. Contacts are established with the medical and dental professions and with the general public by means of exhibitions and conventions.—H. V. H.

Tanganyika Territory. (1938). **Veterinary Education [in 1937].** [Lowe, H. J.] —*Rep. Dep. vet. Sci. Tanganyika, 1937.* pp. 154-155.

Veterinary education of natives of Africa only is referred to. The curriculum included :– (a) elementary anatomy and physiology of the domesticated animals, and (b) the more important diseases of the domesticated animals in Tanganyika Territory. Ten out of 12 selected students had completed the course and satisfied the examiners, and were performing very useful work as native veterinary assistants

both in the field and the laboratory. The course would occupy an intermediate position between the higher standard of the Veterinary School in Uganda and the very elementary instructions given to native " veterinary guards ".—S. A. Evans.

du Toit, P. J. (1937). Veterinäre Tropenmedizin in Südafrika. [**Tropical Veterinary Medicine in South Africa**].—*Festschrift Bernhard Nocht, 1937.* pp. 631-635. Hamburg : Friederichsen, de Gruyter & Co. [In German].

An outline of the more important animal disease problems of South Africa and of the ways in which they were brought under control by Koch, Theiler and others. The diseases dealt with include nagana, East Coast Fever, rinderpest, African horse-sickness, and bluetongue.—J. E.

Chew, A. P. (1937). **The Response of Government to Agriculture. An Account of the Origin and Development of the United States Department of Agriculture, on the Occasion of Its 75th Anniversary.** pp. 107. 1 appendix. [2 refs.] Washington : United States Government Printing Office. [8vo] [15 cents].

This is a popular booklet. Veterinarians will be interested chiefly in the chapter on animal diseases (pp. 30-32), for the control of which the Bureau of Animal Industry was founded in 1884 with the immediate purpose of eradicating contagious bovine pleuro-pneumonia.—J. E.

Farinas, E. C. (1938). **The Veterinary Services and Animal Husbandry in the Philippines.**—*J. S. Afr. vet. med. Ass.* **9.** 155-165.

The Bureau of Animal Industry comprises five divisions, those of Animal Disease Control, Veterinary Research, Animal Husbandry, Animal Products, and Administration. The country is divided into 15 veterinary districts, each embracing 2-3 provinces. The field veterinarians are subject to a semi-military organization owing to the requirements of the country. The eradication of rinderpest without slaughtering-out, which required almost superhuman efforts owing to the nature of some parts of the country, is regarded as the greatest achievement of the veterinarian in the Philippines. Meat inspection and animal husbandry are both in charge of veterinarians, and artificial insemination is applied extensively.

—E. M. Robinson.

Moguel, F. (1938). **Veterinary Medicine in Mexico.**—*J. Amer. vet. med. Ass.* **93.** 214-216.

An account is given of veterinary education in Mexico, beginning with the establishment of a government agricultural and veterinary school at San Jacinto in 1854. This was closed in 1914 but re-opened as the National School of Veterinary Medicine in 1916. Great progress was made and in 1929 this school became affiliated to the University of Mexico. The six year course followed by students is outlined ; before graduation students are employed as assistants in laboratories, clinics, abattoirs, " packing houses " etc. Information is given concerning educational assistance in the form of grants which are made to the majority of students. The article concludes with references to the various openings available to veterinarians and a short history of the Bureau of Agriculture and Livestock up to the time of its reorganization in 1931.—J. C. Wallace.

Linon, G. (1938). La vente des bovidés atteints de tuberculose légalement contagieuse est-elle nulle ? [**Annulment of the Sale of Tuberculous Cattle in France**].—*Rec. Méd. vét.* **114.** 722-726. [3 refs.]

This article is a discussion of the legality of any sales of cattle which are found

to be tuberculous within the meaning of the law. L. considers that such sales are null and void, because these animals cannot be the object of a free contract, according to the civil law; in his opinion, it should be possible forthe buyers to get such sales annulled.

ANON. (1939). Amélioration de la recherche scientifique vétérinaire. [**Government Support for Veterinary Research in France**].—*Rev. Méd. vét., Toulouse.* **91.** 100-101.

By a decree of May 24th, 1938, a veterinary research council was formed consisting of nine prominent veterinary officials and the several inspectors general of veterinary sanitary services under the presidency of the Minister of Agriculture. The council give advice on the subject of research and on funds to be allocated for it.—J. E.

I. HOFMANN, F. (1938). Der Tierärztliche Berufsstand in Oesterreich und seine dienstliche Gliederung. [**Veterinary Service in Austria**].—*Dtsch. Tierärztebl.* **5.** 225-229.

II. BAUER. (1938). Das Veterinärwesen in Oesterreich. [**Veterinary Affairs in Austria**].—*Reichsgesundheitsblatt.* **13.** 290-291.

I. An interesting account of veterinary affairs in Austria, published in June, 1938. After the war there was a surplus of veterinary surgeons in the country, and therefore much poverty among them. The civil veterinary service is attached to the Ministry of Agriculture and Forestry, and consists of an official veterinarian in each of 90 government districts. These persons deal with scheduled diseases, market inspection etc. All meat inspection is carried out by veterinarians.

The Animal Diseases Control Institute at Mödling was founded in 1909 and is now organized in three departments—for the preparation of biological products, for diagnosis and for research. The staff comprises eight veterinarians and 70 other workers.

Veterinarians play an important part in the organization of animal breeding and there are 20 veterinary officers in the Austrian army.

A short account is given of the Veterinary College at Vienna. In June, 1938, there were 16 professors, 42 teaching assistants, and some 300 students.

II. After mentioning the laws on which animal disease control is based in Austria, B. goes on to point out certain modifications which have been enacted in order to bring the country into line with Germany.—J. E.

OFFICIAL AND OTHER REPORTS

TANGANYIKA TERRITORY. (1938). **Annual Report of the Department of Veterinary Science and Animal Husbandry 1937.** [HORNBY, H. E.] pp. 158. 29 figs. on 13 plates, numerous tables, 2 maps. Dar-es-Salaam: Govt. Printer [fcp] [Shs 5]. [See also *V. B.* **8.** 326].

This report is of the same character as in the past, but the contents are arranged somewhat differently to conform with a uniform method of preparation suggested for Colonial Veterinary Departments. A comprehensive index assists in easy reference to sections and sub-sections.

Owing to the enormous preponderance of native-owned stock, the field operations described of necessity refer mainly to these, but the economic research being conducted should benefit the European settlers in the first place.

The research section is devoted almost entirely to nutrition and pasture experiments. Animal disease problems which are included under " Laboratory Operations " received but scant attention owing to decreased European personnel,

According to the livestock census there were 5,035,088 cattle and some 4,460,169 sheep and goats. The expenditure on the veterinary department was £40,000. [Sections of the report are abstracted separately in this *Bulletin*].—S. A. E.

TANGANYIKA TERRITORY. (1938). **Disease Control [in 1937].—Part I. Field Operations.** [LOWE, H. J.]—*Rep. Dep. vet. Sci. Tanganyika, 1937.* pp. 9-20. 1 table, 2 maps.

FIELD OPERATIONS.

TRYPANOSOMIASIS.—With more than two-thirds of the country submerged in a sea of tsetse-infested bush, the incidence of trypanosomiasis continued in all domesticated animals inhabiting areas on the periphery of, or often surrounded by, "fly" belts. *T. congolense*, *T. vivax* and more rarely *T. brucei* are the species of trypanosomes chiefly responsible for general mortality, whilst the rapidly fatal *T. simiae* of pigs was recorded from the Northern and Tanga Provinces. Discriminative clearing of bush in the vicinity of Mpwapwa laboratories is being carried out, under the guidance of the Tsetse Research Department, in an endeavour to stop the encroachment of *Glossina pallidipes*.

EAST COAST FEVER.—The position in regard to this tick-borne disease remained unaltered in any material aspect. Excellent results are obtained where dipping tanks are available and regular dipping can be enforced, but such facilities are few and far between.

RINDERPEST.—1937 was rather disastrous owing to the spread of this disease, and practically every province in the Territory became affected. At the close of the year a continued southward spread constituted a direct menace to neighbours to the south, *viz*, Nyasaland and Northern Rhodesia.

CONTAGIOUS BOVINE PLEURO-PNEUMONIA.—The outstanding feature in this disease was an outbreak in the Musoma district of the Lake Province. This was the first time, in British Administration, that the disease had spread outside its close quarantine areas in the Northern and Tanga Provinces.

Other diseases such as anthrax, blackquarter, heartwater, foot and mouth disease, tuberculosis, brucella infection, anaplasmosis, piroplasmosis, rabies, various skin diseases, plant poisoning, etc., are recognized and their significance is discussed, and there are brief notes on diseases of pigs, horses, dogs and poultry.

MEAT INSPECTION.

The results of the inspection of 15,048 cattle, 25,360 sheep and goats and 668 pigs are briefly reviewed. *Cysticercus bovis* in cattle and *C. cellulosae* were as usual the main cause of condemnation of whole carcasses. CASEOUS LYMPHADENITIS was frequently encountered in sheep and goats.—S. A. EVANS.

TANGANYIKA TERRITORY. (1938). **Disease Control [in 1937]. Part II. Laboratory Operations.** [EVANS, S. A.]—*Rep. Dep. vet. Sci. Tanganyika*, 1937. pp. 21-23.

Planned research on specific animal disease was practically abandoned owing to increased routine and decreased European personnel.

ANTI-RINDERPEST SERUM AND VACCINE PRODUCTION.—Field issues amounted to 106,660 doses of serum (unit 40 c.c.) and 7,800 doses of vaccine (unit 10 c.c.). Production was seriously handicapped by intercurrent TRYPANOSOMIASIS in the serum producers.

MORBID SPECIMENS.—6,068 specimens were received for examination, from field sources, an increase of 1,419 over the previous year. A high percentage of these specimens consisted of blood and organ smears which were promptly dealt with by trained native veterinary assistants.

UNION OF SOUTH AFRICA. (1937). **The South African Institute for Medical Research. Annual Report for the Year ended 31st December 1936.** [LISTER, S.] pp. 98. 8 tables, 2 photographs. [Numerous refs.] Johannesburg: The South African Institute for Medical Research. [8vo].

A commencement was made with an attempt to isolate bovine strains of *Mycobacterium tuberculosis* from human sources. Thirty-eight strains were isolated from bone, joint and other material from young subjects, but all proved to be of the human type. A number of sera, mainly from South West Africa were positive to the agglutination test for brucella infection, using smooth strains of both *Br. abortus* and *Br. melitensis*. Two cases of empyema in man were encountered where the cause was found to be a species of *Actinomyces*, corresponding to *A. asteroides* which is recorded as causing pulmonary lesions in both man and laboratory animals.—E. M. ROBINSON.

UNION OF SOUTH AFRICA. (1938). **The South African Institute for Medical Research. Annual Report for the Year ended 31st December, 1937.** [LISTER, S.] pp. 88. 2 tables, 2 photographs. [Numerous refs.] Johannesburg: The South African Institute for Medical Research. [8vo].

The search for bovine strains of *Mycobacterium tuberculosis* in cases of TUBERCULOSIS in man was continued. Ninety-eight strains were isolated from bone, joint, gland and other material, but no bovine types were encountered.

During the year, cases of *Listerella monocytogenes* infection were encountered among rodents in the Northern Transvaal which were suspected of being plague-infected.

A case of RABIES is described in which the cerebrospinal fluid was shown to be free from the virus. In another case, judging from the history obtainable, the incubation period was ten months.—E. M. ROBINSON.

PALESTINE. (1938). **Report of the Veterinary Service of the Department of Agriculture and Fisheries for the year ended 31st March, 1938.** [SMITH, J. M.] pp. 20. 6 appendixes. Jerusalem: Govt. Printer. [fcp].

ANIMAL CENSUS.—According to the fourth biennial census the following stock were in the country :– 175,000 cattle, 209,000 sheep, 361,000 goats, 20,000 horses, 9,200 donkeys, 28,000 camels and 2,660,000 poultry.

ANIMAL DISEASES.—CONTAGIOUS MASTITIS due to *Streptococcus agalactiae* is reported to be spreading, but as in the case of TUBERCULOSIS, funds and personnel are not available for its control. There were 56 outbreaks of ANTHRAX, involving 15,000 animals, 221 of which died. An increase in the incidence of TUBERCULOSIS was revealed by the survey in 1937, but in view of the financial situation the Government was unable to provide funds for a plan of eradication. Ten cases of EPIZOOTIC LYMPHANGITIS were reported, and 17 of GLANDERS. There were no cases of HAEMORRHAGIC SEPTICAEMIA. Several outbreaks of SALMONELLA infection occurred in chicks 1-80 days old and in ducklings, with a high mortality. The number of herds under control for BOVINE CONTAGIOUS ABORTION was 125, an increase of 16 over the previous year. Only one outbreak of BLACKLEG was reported. Sixty-two mares and eight stallions were found to be affected with DOURINE. The country remained free from serious epizootic diseases such as RINDERPEST and BOVINE PLEURO-PNEUMONIA. FOOT AND MOUTH DISEASE was introduced by smuggled cattle, and spread fairly rapidly, but the outbreak had subsided by August. There were 132 suspected cases of RABIES, and of 819 biting animals placed under observation 14 were found to be rabid. An outbreak of FOWL PLAGUE occurred, bur drastic measures were successful in localizing the disease. Tick-borne diseases continued to take a toll of the country's animals.

Research Section. [Simmins, G. B.]—A total of 40,375 specimens was examined. Of 34,289 agglutination tests on the blood of cattle, performed in connexion with the control scheme for Contagious Abortion, 195 gave positive results. 991 private samples and 170 samples from cattle in quarantine were also examined, and of the latter five were positive. Of 3,139 animals subjected to the complement-fixation test for Dourine, 67 (2·1%) were found to be infected. There were six outbreaks of Pulpy Kidney Disease (Enterotoxaemia). Four cases of Contagious Bovine Pleuro-Pneumonia were detected in cattle imported for slaughter. Nine cases of Fowl Typhoid and 39 cases of Fowl Cholera were diagnosed. A vaccine for the former and an antiserum for the latter are maintained and issued for use in outbreaks. 68,300 doses of pigeon pox vaccine were issued.

Animal Quarantine Service.—260,800 animals were imported, as compared with 320,000 in 1937 and 520,000 in 1936.

Austria. (1938). Tätigkeitsberichte der Station für Tierseuchendiagnostik an der Staatanstalt für Tierseuchenbekämpfung in Mödling für das Jahr 1937. [**Report of Work at the Diagnostic Station of the State Institute for the Control of Animal Diseases, Modling, for the Year 1937**].—*Wien. tierärztl. Mschr.* **25.** 738-741.

This report is extremely condensed and cannot conveniently be abstracted. It deals with infectious and parasitic diseases of domestic and game animals, and with bacteriological meat inspection.—J. E.

Norway. (1935). Det Civile Veterinaervesen 1933. [**Report of the Civil Veterinary Service for 1933**]. [Thorshaug, N. P.] pp. 77. Numerous tables. Oslo: I Kommisjon hos H. Aschehoug & Co. [8vo] [Kr. 1.25].

General.—The report covers the year ending December 31st, 1933, and gives statistics and general reviews on the different branches of work undertaken by the veterinary department of the Ministry of Agriculture. The report is divided into two parts, *viz*, the Civil Veterinary Service, and Meat Inspection. There are also short accounts, quoted from the annual reports of veterinary practitioners, of peculiar cases of particular diseases, the course of atypical outbreaks, successful methods of treatment, etc.

In 1934 there were 336 veterinary surgeons licensed to practise in Norway, and the government expenditure on the Veterinary Service for the financial year 1933-1934 amounted to Kr. 580,015 [£32,223]. Figures are given for export and import of livestock; special licence must always be obtained for the latter.

Animal Diseases.—The state of health of livestock during the year was very satisfactory. None of the more serious contagious diseases spread to any great extent, and there were no outbreaks of foot and mouth disease, rabies, glanders and farcy, swine fever or sheep scab.

Altogether 284,605 cases of disease in animals were treated by veterinarians during 1933. Incidence and mortality figures are given in tables. Of the notifiable diseases, there were 206 cases of Strangles, 54 sporadic cases of Anthrax (47 in cattle, 3 in horses and 4 in pigs), the lowest number registered during the last 20 years except 1920, 10,663 cases of Swine Erysipelas, with 3·5% mortality, 1,169 abortions due to Brucella Infection, 29 cases of Blackleg, 152 cases of Braxy, 866 cases of Piroplasmosis in cattle (not notifiable), 415 cases of Bovine Malignant Catarrh, and 9 cases of Equine Infectious Anaemia. Of 7,013 poultry blood samples, 61 gave positive reactions for Fowl Typhoid.

Forty-three herds of cattle, 389 of swine and 22 poultry farms were declared newly-infected with Tuberculosis. In 22 herds of cattle the infection was

successfully controlled, but at the end of the year there still remained 121 herds of cattle, 560 of swine and 57 flocks of poultry containing positive reactors to the tuberculin test.—GUSTAV NAERLAND (OSLO).

NORWAY. (1936). Det Civile Veterinaervesen 1934. [**Report of the Civil Veterinary Service, 1934**]. [THORSHAUG, N. P.] pp. 114 Numerous tables. Oslo: I Kommisjon hos H. Aschehoug & Co. [8vo] [Kr. 1.50].

GENERAL.—In 1935 there were 375 veterinary surgeons licensed to practise. The government expenditure on the Civil Veterinary Service for the financial year 1934-1935 was Kr. 580,392 [£32,244].

Export and import figures for livestock are given. The meat inspection report contains records of the number of carcasses inspected and their classification and marking.

ANIMAL DISEASES.—The general state of health of livestock in 1934 was satisfactory. There were no epizootics of foot and mouth disease, glanders and farcy, swine fever or rabies. 317,447 cases of disease in animals were treated by veterinarians during 1934, details being given in tabular form. There were 245 cases of STRANGLES, 47 cases of ANTHRAX, 10,969 of SWINE ERYSIPELAS, 27 BLACKLEG, 154 of BRAXY, 3 of EQUINE INFECTIOUS ANAEMIA, 5 of CONTAGIOUS EQUINE PLEURO-PNEUMONIA, and 377 of BOVINE MALIGNANT CATARRH.

In the work on TUBERCULOSIS 17,013 head of cattle in 1,240 herds were tested during the year, the cost of 145 of the herd tests being borne by the State. Of the total number of cattle tested, 2·25% gave a positive reaction; 51 herds of cattle, 379 of swine and four poultry farms were declared newly-infected during the year. 384 cattle that had given positive reactions to the tuberculin test were slaughtered, compensation being made by the State. Fourteen herds were declared free from infection, and at the end of the year there remained 158 herds of cattle, 939 of swine, and 61 poultry farms known to be infected with TUBERCULOSIS. Of the total number of cattle carcasses submitted to meat inspection, tuberculous lesions were found in 0·18% (319), the majority of which (270) were cases previously detected by means of the tuberculin test. A new scheme for the control of BOVINE BRUCELLOSIS was brought into operation on January 1st, 1935. Of 3,391 poultry blood samples, 25 gave a positive reaction to the test for FOWL TYPHOID.

Special appendixes contain the text of the relevant acts and orders, with their corresponding amendments as on August 1st, 1936, notably the Animal Disease Act and Orders, together with those relating to meat inspection, import and export of livestock, etc.—GUSTAV NAERLAND (OSLO).

NORWAY. (1937). Det Civile Veterinaervesen, 1935. [**Report of the Civil Veterinary Service, 1935**]. [THORSAUG, N. P.] pp. 75. Numerous tables. Oslo: I Komisjon hos H. Aschehoug & Co. [8vo] [Kr. 1.50].

GENERAL.—In 1936 there were 377 veterinary surgeons in Norway, 157 being State district veterinarians and 205 otherwise professionally occupied or in private practice. Government expenditure on the Civil Veterinary Service amounted to Kr. 1,021,498 [£56,790] for the financial year 1935-1936. Import and export figures for livestock are given.

ANIMAL DISEASES.—The general state of health of livestock in 1935 was satisfactory; the country was free from foot and mouth disease, glanders and farcy, swine fever and rabies.

During the year, 327,957 cases of disease in animals were treated by veterinary surgeons. Incidence and mortality rates are tabulated. There were 226 cases of

Strangles, 43 of Anthrax (the lowest incidence since 1889, the year in which the first of this series of reports appeared), 22 of Johne's Disease in cattle and 9 in goats, 8,968 of Swine Erysipelas, 50 of Blackleg, 97 of Braxy, 7,356 of Ringworm, 1,191 of Piroplasmosis in cattle, 420 of Bovine Malignant Catarrh, 11 of Equine Infectious Anaemia, 11 of Contagious Equine Pleuro-Pneumonia, and 6,046 cases of Milk Fever in cows and 354 in sheep.

In the year's work on Tuberculosis, 810 herds were tuberculin tested, 170 of these at the expense of the State; of the total number (11,445) of cattle tested, 420 (3·67 %) gave positive reactions. Thirty-six herds of cattle, 299 of swine, and 10 poultry farms were declared newly infected. Most cases of Tuberculosis in pigs were believed to be of avian origin [from this evidence it is considered that the number of infected poultry farms reported is probably underestimated]. Meat inspection of 176,631 ox carcasses, calves excluded, revealed tuberculous lesions in 318, of which 283 had given positive reactions to the tuberculin test. Bovine Brucellosis was controlled according to the new scheme [*V. B.* **5.** 514 and 794.], and special semi-annual reports on that work are issued [abstracted separately in this *Bulletin*].—Gustav Naerland (Oslo).

Norway. (1938). Norge: Det Civile Veterinaerwesen, 1936. [**Report of the Civil Veterinary Service, 1936**]. [Thorshaug, N. P.] pp. 70. Numerous tables. Oslo: I Kommisjon hos H. Aschehoug & Co. [8vo] [Kr. 1.50].

General.—In 1937 there were 381 veterinary surgeons in Norway licensed to practise. The Government expenditure on the Civil Veterinary Service amounted to Kr. 1,130,461 [£62,803] for the financial year 1936-1937. The main items were :– Kr. 395,000 constituting a certain percentage of the district veterinarians' salaries and their total travelling expenses; Kr. 290,500 for salaries and maintenance of the Norwegian College of Veterinary Science, which was not then fully established; Kr. 106,935, for salaries and maintenance of the State Veterinary Institute, and Kr. 250,000, for the control of diseases in livestock which are liable to cause especially severe losses (*e.g.*, Bovine Brucellosis). Import and export figures for livestock are given.

Animal Diseases.—The general state of health in livestock in 1936 was very satisfactory. The scheme for the control of Bovine Brucellosis proved successful, and there was a further decrease in the number of cases of Tuberculosis in cattle. There were no cases of foot and mouth disease, glanders and farcy or rabies.

338,818 cases of animal disease were treated by veterinarians during the year; occurrence and distribution are tabulated. There were 15,855 cases of Mastitis in cows, 51 cases of Anthrax, 16 cases of Johne's Disease in cattle, 10,964 of Swine Erysipelas, 32 cases of Blackleg, 85 cases of Braxy, 98 cases of Tetanus in horses, 24 in cows, and 6 in sheep, 373 cases of Bovine Malignant Catarrh, 6,255 of Cow Pox, 3 of Equine Infectious Anaemia, 182 cases of Goat Pox, 96 cases of Mange in cattle, 34 in horses, 832 in pigs, and 278 in dogs, 1,722 cases of Dog Distemper, and 21 cases of Purpura Haemorrhagica. Eighteen herds of cattle were declared newly-infected with Tuberculosis during the year, 19 were regarded as clean and were released from the official regulations, imposed on them and at the end of the year 148 herds remained infected. Of 195,305 ox carcasses (excluding calves) examined at meat inspection, 171 (0·087 %) had tuberculous lesions, 162 of the animals having previously given positive reactions to the tuberculin test.

By the end of 1936 the scheme for the eradication of Bovine Brucellosis had been in force for two years. During that time 2,741 herds had been registered as infected, but at the end of the same period the eradication work had progressed

so far that 75·6% of the above number of herds were already regarded as clean and released from the official regulations previously imposed on them.

—Gustav Naerland (Oslo).

Yugoslavia. (1938). Izvještaj o radu Drz. bakteriološkog i seroloških zavoda u Krizevcima od god. 1923-1938. [**Report of the State Bacteriological and Serological Institute at Krizevci, 1923-1938**]. [Hupbauer, A.]—*Vet. Arhiv.* **8.** 373-440. 10 figs., 18 tables, 7 charts. [German summary].

The present State Bacteriological and Serological Institute at Krizevci was established in 1901 as a part of the State School of Agriculture (which was transferred to Zagreb in 1920 and given the rank of High School). The Institute was under the direction of Professor Kern until 1922 ; since then Professor Hupbauer has been Director and has enlarged it by adding Serological, Virus, and Parasitological Departments. The staff consists of seven veterinary workers.

All veterinary vaccines and sera for use in Yugoslavia are prepared at this Institute, except those against Sheep Pox and Swine Fever, and this is the only Institute in Yugoslavia where mallein and tuberculin are produced. Autovaccines are prepared on request. Sobernheim's vaccine against Anthrax was made exclusively up to 1934, when the glucoside vaccine was introduced ; Sobernheim's vaccine is still used for horses. Because the irritant property of saponin may lead to gas gangrene in cattle, another vaccine, without saponin, has been prepared recently. The Lorenz vaccine against Swine Erysipelas is also produced. At first Preisz's muscle powder against Blackleg was made, but it was later replaced by filtrate ; anatoxin is now used.

Recently, work on ticks in Yugoslavia has been undertaken by the Institute.—B. Oswald (Križevci).

French West Africa. (1938). Fonctionnement des laboratoires en 1937. [**Report of the Veterinary Laboratories for 1937**]. [Curasson, G.]—*Bull. Serv. zootech. Epiz. A. O. F.* **1.** No. 3. 29-47. [1 ref.]

Organization

In 1937 the laboratories of French West Africa were reorganized, so that from that year onwards there were central laboratories at Dakar and Bamako and local ones in each province except Mauritania [see *V. B.* **8.** 53]. At Dakar there are now three whole time veterinarians, and the budget amounts to 438,800 francs.

Routine Work

Details are given of the output in biological products of the laboratories ; the provincial ones produce little else but rinderpest serum, while the central ones produce all the other veterinary biological preparations required in French West Africa.

Research

Numerous items are included, of which the following are noteworthy :–

Bacterial Diseases.—From a strain of tubercle bacillus isolated at an abattoir, an exotuberculin was made for tests on zebu cattle. *Pseudomonas pyocyanea* infection was studied [*V. B.* **9.** 364]. Fowls affected with *Salmonella gallinarum* infection are stated to have recovered after treatment with intravenous injections of charcoal (prepared for this purpose) and also of soluseptazine.

Protozoan Diseases.—A Trypanosomiasis survey was begun : the following species have been identified :– *Tryp. evansi* (*soudanense*) in horses in the Ivory Coast and in cattle in French Sudan, where tsetse, tabanids and *Stomoxys* are all regarded as vectors ; *Tryp. vivax* (*cazalboui*) and *Tryp. congolense* (*dimorphon*) in cattle. Over 6% of dogs at Dakar were found infected with Leishmaniasis, the majority

having skin lesions: the formol-gelification and lacto-gelification tests were found to be fairly reliable, but gave positive results in PIROPLASMOSIS. Intradermal inoculation and introduction *per vaginam* in a goat of bone-marrow from an infected dog failed to produce infection, and a subcutaneous inoculation of a canine strain of culture into a horse was similarly unsuccessful. Coccidiosis was diagnosed only in rabbits and dogs. AEGYPTIANELLA INFECTION was diagnosed in fowls and HAEMOPROTEUS INFECTION in pigeons. Short notes are given on spirilla in sheep and fowls.

VIRUS DISEASES.—An attempt to adapt RINDERPEST virus to the brains of mice was unsuccessful. A trial vaccine consisting of virus mixed with filtered normal ox bile gave varied results when used on cattle. A type of dried and pulverized vaccine was also made, but no test results are mentioned. Calves inoculated with saponin-virus mixed for a period up to 24 hours proved immune when infected 12 days later and again 3, 6 and 9 months after vaccination. Sudanese goats are fully susceptible to RINDERPEST, so that it is impossible to make a goat-attenuated virus as in India. Attempts to establish serial cultures of the causal agent of CONTAGIOUS BOVINE PLEURO-PNEUMONIA failed.—J. E.

BOOK REVIEWS

BOYD, W. [M.D., LL.D., M.R.C.P. Ed., F.R.C.P. Lond., Dipl. Psych., F.R.S.C., Professor of Pathology, University of Toronto]. (1938). **Surgical Pathology.** pp. 886. 476 figs. [Numerous refs.] London & Philadelphia: W. B. Saunders Company. [4th Edit.] [8vo] [45s.]

The fourth edition of this work—the first appeared in 1925—fully maintains the high standard of those which preceded it. The subject matter has been brought fully up to date and short lists of references are supplied at the end of each chapter. The introductory chapter, which was omitted from the third edition, has been reinserted and gives an excellent account of the dependence of modern surgery on an adequate understanding of pathology. The second chapter of 20 pages deals with the relation of the surgeon to the laboratory, and the methods given for collecting and sending in material are of considerable interest alike to the medical and veterinary practitioner.

The illustrations, including several colour plates, are excellent. The magnification is not always given, however, and this is a serious omission in a work to be used by students.

The book forms an invaluable work of reference for all who are concerned with research and teaching of veterinary pathology, as well as for the practitioner desiring a better understanding of surgical pathology without which " . . . he will flounder along in an aimless fashion, hitting now the malady and again the patient, he himself not knowing which " (Osler).—E. G. WHITE.

HEGNER, R. [Ph.D., Professor of Protozoölogy, The Johns Hopkins University], ROOT, F. M. [Ph.D., Late Associate of Medical Entomology, The Johns Hopkins University], AUGUSTINE, D. L. [Sc.D., Assistant Professor of Helminthology, Harvard University], & HUFF, C. G. [Sc.D., Associate Professor of Parasitology, University of Chicago]. (1938). **Parasitology. With Special Reference to Man and Domesticated Animals.** pp. xxi+812. 308 figs., 5 tables. [Numerous refs.] New York & London: D. Appleton-Century Company. [8vo] [25s.]

This book is a revised and enlarged edition of one published by HEGNER, ROOT and AUGUSTINE, some nine years previously, under the title " Animal Parasitology ".

Following a brief introduction by Dr Hegner, the book deals with more important parasites of man and the domestic animals, in three sections :– " Protozoology ", by Hegner, " Helminthology ", by Augustine, and " Entomology ", by Root ; the last section, owing to the death of Dr Root, has been revised by Huff. As one of the book's aims is to be of service in the teaching of parasitology, a few of the commoner parasites of wild animals are included because of their availability, or their special value for teaching.

It is impossible to deal fully with such an enormous range of subjects as parasitology now comprises, within the compass of some 800 pages, so that much has necessarily been omitted. However, one would like to have seen some mention of TYZZER's work on coccidiosis, and the several species now known to be involved, and of recent work on the life-histories of the lungworms of sheep, and of WELL's work and FOURIE's work on the blood-sucking activities of *Ancylostoma* and of *Haemonchus*. On the whole, however, it must be acknowledged that the selection of the more important points from the great mass of available information has been well and wisely carried out.

Although the index is very brief, the bibliographical list extending over 80 pages is most useful : the numerous illustrations are also well chosen, and there can be no doubt that the book will serve its purpose well as a manual for students, and for the use of practising veterinarians and physicians.—E. L. TAYLOR.

BROCQ-ROUSSEU, D. [Membre de l'Académie de Médecine], & ROUSSEL, G. [Ancien Président de l'Académie vétérinaire de France]. (1939). Le sérum normal. Propriétés physiologiques. [**The Physiological Properties of Normal Serum**]. pp. 630. [Numerous refs.] Paris : Masson et Cie. [8vo] [Fr. 140].

This volume deals with the physiological properties of normal serum from the point of view of the bacteriologist. The subject matter is divided into chapters dealing with the antigenic property, agglutinating property, haemolytic property, etc., of normal serum. Each chapter represents a concise review of existing knowledge, the opinions of a large number of workers being given in each case. These, however, are set out more or less as isolated statements, and the reader must draw his own conclusions as the authors make no attempt to do so. The book thus becomes a reference book, and for this purpose it will be found of greatest value to all bacteriological workers.—J. A. NICHOLSON.

SCHULZ, F. N. [em o. ö. Prof. der Universität Jena]. (1938). Grundriss der chemischen Physiologie. [**Chemical Physiology**]. pp. vii+181. 1 fig. Jena : Verlag Gustav Fischer. [8vo] [RM. 7].

The experience of lecturing to medical students for many years has prompted the author to write this book, in which his object has been to provide the student with a concise account of the chemical and physical processes of the body, without overburdening him with excess of detail.

Many biochemists are of the opinion that they are not concerned with the application of their subject to physiology, the result being that many text books books entitled " Physiological Chemistry " deal in fact with pure biochemistry. The author is admirably qualified to overcome this difficulty, and his book gives a good account of the chemical side of physiology. The subjects are presented in a well-planned manner, each chapter being subdivided into sections. The chapters on digestion and metabolism are particularly good, whilst the question of cellular oxydation is considered in fair detail. Students should find this book a great help to them, but it does not contain sufficient detail to be classified as a book of reference.—A. T. PHILLIPSON.

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39, Museum Road, Oxford, England.

INDEX VETERINARIUS

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The latest list of the publications indexed for this purpose was included in *Index Veterinarius*, Vol. 6, No. 1 (issued December, 1938) and also circulated with the *Veterinary Bulletin*, Vol. 9, No. 1.

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The dates of issue of the two numbers of each volume are as follows: —

No. 1.—Issued December. Indexing period previous January—June.
No. 2.—Issued June. Indexing period previous July—December.

Vols. 1 to 3 (1933, 1934 and 1935) of the Index were produced on a duplicator; from Vol. 4 onwards it has been printed.

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IMPERIAL BUREAU OF ANIMAL HEALTH,
NEW HAW, WEYBRIDGE,
SURREY, ENGLAND.

Printed in Great Britain
by
H. R. Grubb, Ltd., Croydon.